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PREFACE TO THE REPRINT, 1874.

By C. B. Clarke.

The present selling price of Roxburgh's Flora Indica (Carey's Edition) in ndon is £ 5, and of Piddington's Index is £ 1. The present reprint is priced s.: and this is a sufficient reason for the undertaking of the reprint.

The Flora Indica of Roxburgh is still the only Hand-book of the plants of ia that we have: and the study of Indian Botany has been for years barred, h for students of the Medical College and for all English denizens who do not pen to have come to India well acquainted with a large number of the tropical atic genera, by the impracticability of obtaining a copy of the only book t can help them. During my sojourn in India, scores of persons must have sulted me how to get some acquaintance with the numerous and striking nts around them: and to all I have been obliged to give one answer, *viz.*, that re is but one book, and that unattainable. The Flora Indica of Roxburgh has n quoted so largely and widely in botanic literature that a copy is essential every botanic library, and by the multiplication of such libraries the price of few copies of Roxburgh floating in the market is being steadily pushed up.

In order that the present reprint may completely supply to professional anists the place of the scarce original, the reprint has been made a verbatim l literal one; all the errors of the original having been faithfully retained; n the genus Loranthus is printed twice over, as Carey printed it twice. For last reading of the proofs of the reprint before the press I am indebted to friend H. H. Locke, Esq., whose name will be a sufficient guarantee (to all o know his work) of the careful accuracy of the reprint. The paging of rey's edition is added in the margin so that the references to the original xburgh can be immediately found in the reprint without referring to the lex.

The publication of Roxburgh's manuscript Flora Indica was commenced by rey and Wallich. The first volume containing the orders (in the Linnæan cession) up to the end of Tetrandria was published in 1820, and is reverâ xburgh's work, the remarks by Wallich himself being trifling. The second ume of Wallich's Edition published in 1824 is in form a continuation of the t, containing about two-thirds of Pentandria: but it really proceeds on an irely different scale. It contains, indeed, the Roxburgh manuscript, but there added crowds of species by Wallich from Nepal, &c., widening the area of the rk altogether. In short, the area was so greatly widened, that Wallich never able to get on any further with the publication.

Wallich's Edition of Roxburgh having thus come to a stop, Dr. Carey at est of Roxburgh's friends published in 1832, in three volumes, Roxburgh's nuscript Flora Indica as he left it: the first portion, up to Tetrandria inclusive, ncides therefore with Wallich's first volume, and the remainder is homogeneous h this first portion, and represents Roxburgh's complete Botanical work in lia, except the Cryptogams.

In the present reprint I have therefore taken no notice of Wallich's second ume, which is on a different scale, contains much that is not Roxburgh's, l is now not scarce or dear in the market; I have printed Roxburgh's own nuscript as it stands in Carey's edition, and have added Roxburgh's Crypto- ms from the Calcutta Journal of Natural History. Griffith's editing of the

written after the fall-out occurred between himself and Wallich. The Indian ferns have been better worked up moreover since that any other department of Indian Botany; and the Synopsis Filicum of Baker leaves little cause for unearthing the antiquated names and crude genera in Roxburgh: nevertheless, there is still something to be got out of Roxburgh's Cryptogams and I have printed them as they occupy only a few pages and render the present reprint a completed abstract record of Roxburgh's work.

I have bestowed much thought and pains on the Index, and have finally adopted the simplest plan, *viz.*, one Index in alphabetical order. I have always found myself that, if there is one Alphabetical Index only to a book, my fingers will find the word and the page mechanically without the current of thought being disturbed: if on the other hand there is one Index to English names, another to Latin names, a third Glossary of Botanic terms, a fourth of Economic Products, &c., I continually find that my fingers lead me to the wrong Index and my train of thought is disturbed with vexation by having to turn aside to consider for an instant in which Index the required word should be sought. It doubtless looks a jumble to see English, Sanskrit, Latin, Teloogoo, &c., words all intermixed, but the alternative, *viz.*, an Index like that of Piddington to Roxburgh, is not an Index, it is rather a classified analysis.

I have included in the Index the native names, though on this point my experience does not lead me to adopt Roxburgh's estimate of the value of such names. Considerable assistance in discriminating Bamboos can doubtless be got from the dealers in Bamboos, though even in this case the name for the species differ in different districts of the same province. So with respect to some other plants, there is a class whose business requires them to know the plants well. But the natives of India have no idea of accurately observing anything, and the best names that even Roxburgh is able to give for common plants are sometimes only Chota Doodhee Luta, Doosera Sag, and such like. As to the grand Sanskrit names they are still of less value than the vulgar ones, being founded on less actual observation, with the object of enriching the language, an object still so dear to every educated Bengalee.

In these remarks I do not mean to say that the vulgar naming of Bengal plants by Bengalis is much worse than the vulgar naming of English plants by Englishmen. I have observed that the eagerness to get native or vulgar names for plants is directly proportioned to the ignorance of the enquirer: those who know nothing about the plants and who are unable to discriminate them under any names being always loud in their call for native or local names.

However, though I cannot think native names deserving the trouble that Roxburgh has bestowed upon them, as I am reprinting Roxburgh and not critically editing him, I have preserved these names both in the text and in the index. The English denizens have also many names of their own for plants; thus "Rhododendron" means Melastoma Malabathricum (or almost any large Osbeckia) and "Indian fir" means Guatteria longifolia: Roxburgh has passed by this class of names altogether; doubtless he thought them likely to mislead as to the affinities of the plants rather than to assist. A plea has been put in for preserving native names on account of their value in tracing the history of plants. But even for this purpose their value has been over-rated. Where no accurate description of the essential character of a plant is on record, there is always more or less doubt concerning the species meant, and whether more than one species may not be meant. It is about as dangerous to assume that a plant is introduced because there is no Sanskrit name for it as it is to assume that it is indigenous because there is a Sanskrit name for it. A very moderate percentage of the indigenous plants have any Sanskrit name. And in some cases where a new plant has been introduced, the Sanskrit name of an indigenous plant which it was supposed to resemble has been transferred to it, and has very soon been monopolised by the new plant. Thus the ancient name for the Tamarix (which species is) is Jhow: this name was applied to the newly-introduced Casuarina equisetifolia and now while every body knows that this Casuarina is called the Jhow, very few know what the Jhow really means.

An Indian Flora is now being prepared at Kew under the direction of Dr. Hooker at the chief cost of the Secretary of State for India; and two parts containing the Natural Orders Ranunculaceæ to Balsamineæ have been published. This new work might be supposed to supersede Roxburgh altogether, and I proceed to shew that this is not the case. In the first place, owing as above shewn, to the extent to which Roxburgh has been quoted, he will always be wanted for reference.

In the second place, the present reprint of Roxburgh is not more than enough to satisfy the public wants of an Indian Hand-book of plants until the Indian Flora of Kew shall be completed, and, until complete, any systematic work is nearly useless for tyros. Of the Kew Flora Indica, two parts are already published it is true, but the earlier orders are comparatively easy : several Flora Indicas have got the First Volume out, (and stopped,) so that these early orders of the series have been worked up before. It is very different with the later orders such as Orchidaceæ and several smaller orders of Monocotyledons difficult to make out from Herbarium specimens. The completion of the Kew Flora Indica must be a work of time.

For, *thirdly*, the Kew Flora Indica comprises the plants of India from the crest of the Himalaya to Ceylon on one side, to Singapore on the other. With such a range, not merely of area but of level, it will contain hardly less than 15,000 plants; and I therefore doubt whether, with the public, it will ever supersede Roxburgh. I do not think that non-professional botanists can use a book containing 15,000 species : unless they have many landmarks, both of orders and genera, well fixed in their minds, to search a book of this size for a plant is worse than searching for a needle in a bottle of hay. Now Roxburgh's book, it has been found by experience, is a useful book for planters and other English denizens who, without being great botanists, take a sufficient interest in the plants to spend a little time in really working with a book.

And, *fourthly*, Roxburgh contains all the economic Indian botany known to him, and we have added very few economic facts since, as Mr. Blechynden the Secretary of the Agri-Horticultural Society observed to me. We have had plenty of Government and other reports, some very large and expensive ones it is true, but we have very little economic work by persons competent as botanists ; and with reference to one large expensive report lately issued on an Indian economic plant, it was discovered, after it was printed, that the Commission never learnt what the plant was. Roxburgh is most trustworthy in his economic botany, and contains virtually all that is known on the subject : the Kew Indian Flora contains no economic botany (the book will be large enough without, and the economic botany is rightly omitted) : so that in this important branch of his subject Roxburgh will not be superseded.

The Kew Indian Flora is of the highest value to Botanists, even each part of it as it comes out is so : it tells those in India what material there is at Kew and how the names are arranged there. And it will, when finished, form the foundation on which all future botanic work in India will be grounded. After the plants have been botanically *determined*, and the names attached so that we are tolerably sure in general that we all mean by the same name the same thing, we may commence economic and other branches of investigation with advantage. Drs. Hooker and Thomson have rightly urged that the Botanical Determination of the plants must come first before any satisfactory progress elsewhere can be made : and Indian Botanists have been right for generations in concentrating and narrowing their work in the manner that Drs. Hooker and Thomson indicated. The Government of India, but a few years back, called on Mr. Kurz to draw up a Forest Hand-book for Burma which should comprise (among other things) a classified account of the different sorts of forests, with all the trees in each, and the plants that usually accompanied each : an account of the method of germination and habit of growth of each tree, and an account of the quality of the wood of each, and a special account of all the species likely to prove of economic value. This last requisition really credited Mr. Kurz with prophetic powers : but the whole command was a putting of the cart before the horse. There may be some 600 trees in Burma, of

which only a very few are thoroughly known to botanists: and if fifty years hence we are in a position to draw up an exhaustive Forest Hand-book of them shewing the method of germination of each tree, our Botanic progress in India will have been marvellous.

In India, the variety of plants at one level, and in one class of soil, is very much below the tropical luxuriance anticipated by readers at home. In the vast delta of the Ganges, Bruhmapootra, and Megna (omitting the isolated patches of red clay which appear as islands in the Mudhopoor jungle, &c.,) Dr. T. Anderson reckoned not more than 600 indigenous plants. But even without proceeding 500 feet above sea-level, there is an enormous increase in the variety of plants in the Terai jungles which skirt the base of the mountains and hills. For an Indian Hand-book Flora, we want a book that shall contain those 2,000 plants that come in the way of ordinary denizens of Calcutta and Madras. Few persons comparatively can visit the mountains or collect in the hot jungles at their base: and those who do so (as tea-planters,) and desire to know the wild plants, must use much larger books. Now Roxburgh's book includes essentially the plains Flora of Calcutta and Madras, with a considerable number of the plants in the Circar Hills up to 2,000 feet, and therefore covers the most useful area for people in general. Also Roxburgh contains an account of all the plants ordinarily cultivated in India in his day, and we have added wonderfully few since. This enhances greatly the value of Roxburgh to horticulturists, and prevents much disappointment to those who search for some widely-spread plant in a hand-book, and are vexed not to find it because it is omitted as introduced.

In hand-books of English plants, the cultivated ones are never included: their number is too great. But the number of cultivated plants in India is very small, so that Roxburgh gets them in easily. In an English garden we can cultivate most plants of colder countries (except Alpine plants which are troublesome) and also most plants of even the Tropics in our stove-houses. In India it must be recollected that we have no corresponding ice-house conservatories, so that our horticultural efforts except for tropical and subtropical species are greatly circumscribed. Tropical jungle plants usually require a *uniformity* of moist heat which is what they do not get in India. At the Calcutta Botanic Garden there are not a dozen foreign trees that can be said to *thrive* so as to be worth cultivation. And the number of indigenous trees worth cultivation is small: the Calcutta garden list of trees recommended and furnished for planting by road-sides, &c., did not exceed twenty in all. Probably, ten times this number could be found which would grow luxuriantly in the Sikkim Terai. This statement will show that there is a tolerably clear line between the ordinary Indian Flora and the Flora of the jungles and mountains: the latter Flora is unmanageable in extent, the former is contained in Roxburgh.

Roxburgh's book contains, besides, a small number of the Terai and mountain plants from Nepal, Sylhet, and Chittagong, and some plants of Penang, the Moluccas (by which Roxburgh means Malaya) and even the Mauritius. Of these plants, (especially the Molucca ones,) the descriptions are often very short; and the species in Roxburgh are not sufficient in number to form any representation of the Flora of the countries. In any new edition of Roxburgh, it would be far better to omit all these species and make the book as a Hand-book of the India plains Flora as manageable in point of size as possible. In a reprint intended to be useful for reference, I have thought it best to retain everything.

The issue of the present reprint has been highly approved by my botanic friends in Bengal: but they have very generally expressed disappointment, because I have not added to each species the modern synonym. I might, from the reduction of Roxburgh's species published by Dr. T. Anderson in the Asiatic Journal, and some other less sure sources, give the modern synonyms for Roxburgh's species adopted at Kew, or I might give the reductions from my own manuscript list of Roxburgh's species. But neither plan would be satisfactory to me.

Some three years ago I sent a paper home to Dr. Hooker, for publication in

Linnæan Journal, on the Bengal Commelynaceæ. In this paper I reduced the two leading species of Roxburgh (Commelyna communis and Commelyna scapiflora) to quite different plants from those to which they had previously been supposed to mean: and this change naturally induced other great changes in the synonymy. But it was only after several letters, after sending home named specimens, and after Drs. T. Thomson and T. Anderson had kindly looked over my paper with the Herbarium bundles, that my proposed changes were accepted.

Doubtless, every order does not require so great changes as Commelynaceæ: still, the number of cases in which I should think it necessary to alter the synonymy of Roxburgh's species is very large; and, as I have learnt by experience in Commelynaceæ, every change would require a full working up of the order and a separate essay or paper in support of it, *at least*. Any such critical edition of Roxburgh, even were I prepared to undertake it, would be a voluminous work and would render the present "reprint" useless for the purposes for which it is principally intended. And on the other hand I decline to hash Roxburgh, or do imperfectly and unsatisfactorily what I could do much better.

Perhaps the next great advance in Indian Botany is the thorough working down of Roxburgh's species. But to do this requires a very complete acquaintance with all the plants of the Indian plains, and a systematic herborising over Roxburgh's best known ground, as Samulcotta. A large number of his species have been lost sight of altogether, and are not to be found in our Herbaria, though it is not therefore to be surmised that Roxburgh may have dreamt them: and many other of his species have been impertinently reduced by various hands to well-known species (themselves described by Roxburgh) on the assumption that Roxburgh had made two species out of one, the true explanation being that Roxburgh's second species was unknown to the man who reduced it as a mere synonym.

No doubt, it would be far more useful than the present reprint to prepare an Indian plains' Flora out of Roxburgh, arranging the plants in Candollian order with the modern names, preserving the economic information and the cultivated plants, adding the new species, since discovered within the same area, and omitting the Moluccа, Mauritius, Penang, and mountain plants. Such a work will be the next great step in advance for Indian botany, but would be the labor of a life that is, if it were done well enough to supersede Roxburgh's book.

There are few botanical books of the date of Roxburgh's Flora (which was really written by him before 1820) that have not been superseded by modern work. No Indian Flora published, however, since Roxburgh's time has attained completion: (in this statement I do not reckon Drury which, being compiled out of books instead of grounded on a study of the material in Herbariums, adds nothing to the previous store of botanical knowledge): and besides this, many of the corrections proposed, even by learned botanists upon Roxburgh, are mistakes: Roxburgh was right. I may mention an instance: Wight and Arnott say that Luffa acutangula Roxb., has five stamens: Roxburgh says three, which is right. Wight evidently never got Roxburgh's plant. Nees has "corrected" Roxburgh's account of the large Cyperi, and "plucked aside" the synonyms in diverse directions: Roxburgh's arrangement, naming, and description of these is really excellent. Nees has positively hashed him. And in taking up any critical Indian genus, it is generally the best plan to get hold of Roxburgh's species first, and fit in all subsequent species afterwards: Roxburgh's work is so excellent, and his species so well conceived, that they form a solid frame-work, which being once put together, all the other species are easily fitted into their due places.

Besides the present Flora, Roxburgh contributed many papers to the Asiatic Society's Journal (some on non-botanical subjects): and he left at the Calcutta Botanic Garden, a set of life-sized colored drawings, with botanical dissections, of plants 2,542 in number, among which nearly all the Indian species described in his Flora Indica are depicted. By these (of which a duplicate set is preserved in the India House, Westminster) the species in the Flora Indica may be verified. Excellent as the Flora Indica is, it does not show us what Roxburgh could have done had he lived to edit his own work: but after his long and arduous servic

in India, he died shortly after his return to England. His friends placed near th large Banyan tree, in the Botanic Garden at Calcutta, a monument ; a stone cylin cer, under a canopy, carrying the inscription :

Quisquis ades

SI LOCUS SUAVITATE MENTEM PERMULCET
AUT ADMONET UT PIE SENTIAS DE DEO
HABENDUS IN HONORE TIBI

ROXBURGHIUS

HORUM HORTORUM OLIM PRÆFECTUS
VIR SCIENTIÆ BOTANICES LAUDE FLORENS
IDEMQUE AMÆNITATUM AGRESTIUM
SUMMUS ARTIFEX
CONSERVAT CINEREM PATRIA
HIC VIGET INGENIUM
TU FAVE ET PERFRUERE
B. M. P. C. SUPERSTITES AMICI A. D. 1822.

PREFACE TO THE THIRD VOLUME

OF ROXBURGH'S FLORA INDICA.

In consequence of what has been mentioned in the Advertisement prefixe to the First Volume of this work, as well as in an Article in the Journal of th Asiatic Society for April 1832, entitled "Review of Indian Botany," page 13 the inference will probably be drawn that the Public have much to regret, in it being presented to the world without Dr. Wallich's additions. To deny this i not the intention of the writer of this Preface, but to offer some further expla nation of the reasons which led to it. In the latter end of 1830, when the Pub lishers determined, with the assistance of the Author's greatly esteemed friend the Reverend Dr. Carey, to complete the Publication of the "FLORA INDICA," upwards of ten years had elapsed since the First Volume of the old Edition ha appeared, during which interval one other Volume only was added to it. At thi period (the conclusion of 1830) Dr. Wallich was in England, and the Publisher had no means of judging when he purposed returning to India, or whether he in tended to remain altogether in Europe. Calls for the completion of the Wor had from time to time been made in the Journals and Periodicals of the day, an the obligation they were under not to allow a Work, the result of much study an labour, to remain longer dormant, had continued undischarged too long. Furthe delay was out of the question. Two modes of Publication now suggested them selves;—one, to complete the remaining Volumes, making use of Dr. Wallich' manuscript Notes and Additions; the other, to publish them without. Both wer set aside: the first was palpably improper, circumstances not admitting of Dr Wallich's acquiescence being previously sought: the second would have given t the world a confused and mutilated work. In lieu it was determined, althoug entailing much additional expence, to REPRINT the two Volumes published in 182 and 1824, leaving out Dr. Wallich's Notes and Additions, and then to complete th work as originally left in Manuscript by the Author. These then are briefly th reasons which induced the Publication of the "FLORA" in its present shape; whethe the public will have really cause to be dissatisfied, is not for an individual to decide The undersigned would merely remark, that had the "FLORA INDICA" been publishe with Dr. Wallich's Additions, the quantity of matter would undoubtedly hav been greatly increased, and so would the price of the Work. It now comprise in three Volumes the greater part of the productions of Hindoostan, Bengal an the Dukshin, including the Coasts, while with Dr. Wallich's additions it woul have also embraced those of Nepal and Ava, and some subsequent discoveries i Bengal and Hindoostan. The bulk and price of the work in the latter case, woul have probably been just double what it at present is;—the public will best decid upon the merits of the two plans.

The friends of Dr. Wallich, among whom the writer of this Preface woul include himself, will not, it is presumed, be disposed to lay much stress upon th circumstance of his labours having been unavailable in the present instance, a they are doubtless sensible that his extensive Researches in the Territories of Av and Nepal, are of themselves capable of furnishing ample materials for a separat Publication. The undersigned desires in conclusion to take this opportunity t convey to the Reverend Dr. Carey, the grateful sense entertained by his Brothe Captain Bruce Roxburgh (who has recently embarked for Europe) and himself of the ready kindness with which the editing of the "FLORA INDICA" was un dertaken, without which proof of his continued attachment to the memory of th Author, the result of his many years study and labour must have longer remaine in oblivion.

JAMES ROXBURGH.

AGRA,
7th Sept. 1832.

FLORA INDICA.

CLASS I.

MONANDRIA MONOGYNIA.

CANNA. Schreb. gen. No. 1.

Anther single, attached to the edge of the petal-like filament. *Style* spatulate, growing to the tube of the corolla. *Stigma* linear. *Capsule* three-celled. *Seeds* several, naked. Page Carey Ed.

C. *indica. Linn. sp. pl. ed. Willd.* 1. 3.

Leaves ovate-lanceolate. *Segments* of the inner border of the corol lanceolate, and bidentate.

Sans. Vuna-kelee, Surva-juya.

Beng. Lal Surva-juya, the red variety, and Shweta Surjuya, the yellow.

Teling. Kristma-tamara.

Katu-bala. *Rheed. Mal.* 11. *p.* 85. *t.* 43.

Cannacorus. *Rumph. Amb.* 5. *p.* 177. *t.* 17. *fig.* 2.

Common over India, and in flower and seed most part of the year.

Observation. The parts of the corolla are exactly alike in both varieties. C. *lutea* of Roscoe, must therefore be different, as in that, the inner limb of the corolla is bifid.

PHRYNIUM. Willd.

Anther single, terminal on a short erect filament. *Style* growing to the tube of the corolla. *Stigma* infundibuliform. *Capsule* three celled, three-valved. *Seeds* solitary, arilled at the base. *Embryo* uncinate, and furnished with a perisperm. I. 2

1. P. *dichotomum R.*

Shrubby, dichotomous. *Leaves* cordate.

Thalia *cannaformis. Linn. sp. pl. ed. Willd.* 1. 16.

Arundastrum. Tonchat seytam. *Rumph. Amb.* 4. *p.* 22. *t.* 7.

Donax *Arundastrum. Lourier. Cochin Ch.* 15.

Sans. Vula, Godunika, Bhudra, Bhudroudunee, Shurakasthika, Kulyaninee, Bhudrabula, Ghata, Patee, Vulahwa.

Beng. Moocta-patee, Pattee-patee,* or Madar-patee.

This elegant shrub is a native of Bengal, as well as of various other parts of India, &c. Flowering time the hot season; seeds ripen in the rains.

Root ramous, woody, perennial. *Stems* straight, tapering and simple to the branches, about as thick as a man's thumb, and from three to five, or six feet high, of a beautiful, highly polished green colour. *Branches* numerous, dichotomous, spreading in every direction, smooth like the stem, but jointed at every division. *Leaves* alternate, petioled, ovate-cordate, smooth, entire, acute, from four to eight inches long; veins numerous, very fine and parallel. *Petioles* sheathing, except a small portion, one-tenth, or less, at the apex, which is round, and may be called the proper petiole. *Racemes* terminal, generally solitary, jointed, a little flexuous. *Bractes* glumaceous, in pairs on the joints of the raceme, each pair embracing between them a two-flowered pedicel. *Flowers* paired, on a common pedicel, from the alternate joints of the rachis, large, pure white. *Pedicels* clavate, thick, white, and fleshy, near the apex two-parted; *divisions* unequal, with two glands at their ends, like the rudiments of flowers. *Calyx* above, three-leaved; *leaflets* oblong-conic, tapering to an acute point, and much shorter than the tube of the corol. *Corol* one-petalled, irregular. *Tube* funnel-shaped. *Border* double; *exterior* of three, equal, linear-oblong, recurved segments. *Inner* elevated far above the exterior on a continuation of the tube, and consists of five very unequal portions: the *exterior* two are larger, obcordate, with waved, expanding margins; the *third* or middle one stands opposite to the first two, is broad, obcordate, deeply emarginate, and of a middling size between the two exterior, and two interior segments; on the inside near the base a semilunar body which projects inward between the anther and stigma; the *inner* two small, and crown the mouth of the tube, closely embracing the stigma and anther. *Filament* short, attached to the margin of the smallest segment of the interior border of the corol. *Anther* erect, simple, ovate-oblong. In this species, as well as in P. *capitatum*, the pollen consists of remarkably large round grains. *Germ* inferior, villous, three-celled, with one ovulum in each, attached to the I. 3

* "Mats made of the stems of this plant, being smooth, and particularly cool, and refreshing, are termed in Hindi *Sitalpati*, which signifies a *cool mat*, whence the plant itself is said to bear "the same name. Suspecting, however, this to be a misappropriation of the term, I have enquired "of natives of the eastern parts of Bengal, who assure me, that the plant is named *Muctapata*, or "Patti-pata, and the mat only is called Sital-pati."—*Colebrooke.*

Page Carey Ed. bottom of its cell. *Style* growing to the inside of the tube of the corol, and does not appear until above its mouth, when it enlarges into an infundibuliform, hooked *stigma*, surrounded with a lobate, callous margin, and directed in an oblique manner toward the face of the anther, as if in search of it, though separated by a callous projection from the base of the middle division of the inner border of the corol. *Capsule* broad, turbinate, size of a cherry, rugose, somewhat three-lobed, three-celled, three-valved, opening from the apex. *Seed* solitary, round, resting on a small, partial, scaly aril. *Integuments* two ; *exterior* soft
I. and spongy, *inner* nuciform. *Perisperm* conform to the seed, horny, tinged blue ; a fissure
4 penetrates from the base pretty far up, separating the two extremities of the embryo. *Vitellus ;* none has been discovered in any of the simple-anthered scitamineæ which have been examined by me. *Embryo* pure white, hooked, with the convexity upward, which corresponds with the periphery of the seed.

2. P. *virgatum. R.*

Stems simple. *Leaves* bifarious, lanceolate. *Spikes* terminal, filiform, compound.

A native of Malabar, from thence sent to the late Dr. Anderson of Madras for the *Cardamom* plant, and by him presented to the Botanic garden at Calcutta, where it blossoms during the rainy season.

Root a stout, crooked, tough, fibrous, horizontal main body, with numerous, thick, strong fibres therefrom ; every part void of odour. *Stems* numerous, erect, six to eight feet high, jointed, lower joint or two much swelled ; invested in the sheaths of the leaves, fistulous ; the largest are about as thick as a slender walking cane near the base, and at the top as thick as a common quill. *Leaves* bifarious, short-petioled on their sheaths, lanceolate, polished ; from six to eighteen inches long. *Sheaths* and *petioles* smooth and even, except the inside of the petioles, where there are a few long, soft hairs. *Spikes* terminal, two or three together, and they are very generally two, or three cleft, very slender, and often near a foot long, jointed, with a two-flowered pedicel at each joint. *Flowers* pure white, inodorous. *Bractes* two or three at each division ; and also embracing the two-flowered pedicels, size very various, but the shape ensiform, and channelled. *Calyx* of three, small, distinct, acute, conic, leaflets. *Corol* with a very short tube ; *exterior* border of three, nearly equal, oblong, reflexed segments ; within are two which are unequal and much larger ; they form the con-
I. spicuous portion of the flower, one is obcordate, the other is obovate ; *inner* segments three,
5 and smaller, the two longest of them form yellow margined hoods for the anther and stigma. *Filament* inserted between two of the inner segments of the corol, erect. *Anther* one-celled, ovate. Germ inferior, hairy, base of three-celled, with one ovulum in each, attached to the axis. *Style* growing to the short tube of the corol, above free, and uncinate. *Stigma* funnel-form. *Capsule* oblong-obovate, size of a field bean, rugose, when ripe pale yellow, three-celled, three-valved. *Partitions* opposed. *Seeds* solitary, oblong ; a small lobate aril round the umbilicus at the base of the seed. *Integuments* two ; *exterior* brown and glossy, *interior* membranaceous. *Perisperm* conform to the seed, and as in P. *capitatum*, &c., a brown substance runs up from the base, into the arch of the embryo. *Embryo* simple, hooked, with the convexity upwards.

Obs. It is almost needless to observe that this plant has no relation to that which furnished the *Cardamom* of Malabar, viz., my *Alpinia Cardamomum.*

3. P. *spicatum. R.*

Stemless. *Leaves* radical, bifarious, oblong. *Spikes* radical, shorter than the petioles, subcylindric, bifariously imbricated.

Plants of this small species were sent by Mr. Felix Carey from Pegu, to the Botanic garden at Calcutta, where they blossom in April and May.

Root perennial, flexuose, creeping horizontally deep in the earth, thick as a ratan ; *fibres* numerous from the main body, and spread in all directions. *Stem* none, the sheathing petioles unite from six to twelve inches in extent, and resemble one, as in the *Curcumas*. *Leaves* in little radical tufts, of three or four each, sub-bifarious, petioled, linear-oblong ; base broad and rounded ; apex tapering, and sharp, both surfaces quite smooth ; position nearly horizontal ; six to ten inches long, by two to three broad. *Petioles*, the most exterior
I. of the tuft sheathing, with their upper part round and smooth, those in the centre (one or
6 two) have no sheath, and are from apex to base round and smooth ; general length of the whole from six to twelve inches, which is nearly the height of the whole plant, the position of the leaves being nearly horizontal. *Spikes* solitary in the centre of the petioles, or lateral from their base, short peduncled, sub-cylindric, acute, apex elevated but little above the soil, imbricated on opposite sides, with four to eight, alternate, bifarious bractes, or sheaths ; each embraces a small spikelet of four or five pairs of sessile, small, nearly white flowers on the back, or interior side of the spikelet, which expand in succession, beginning with the lower pair. *Rachis* flexuose, smooth. *Bractes ; exterior*, or *common*, one at each joint of the spike, sub-cylindric, sheathing, smooth, and rather obtuse ; *interior*, or *proper* one to each pair of flowers. *Calyx* three-leaved ; *leaflets* lanceolate, smooth. *Corol* with a long, very slender, smooth tube. *Border ; exterior* of three reflexed, oblong, obtuse segments ; within these are two larger, round-obovate, erect, curled portions ; *interior*, or *nectarium* small, and like the other species unequally three-lobed. *Anther* one-celled, attached to the inner border of the corol. *Germ* inferior, three-celled, with one ovulum in each, attached to the bottom of the cell. *Style* blended with the tube of the corol, as in the other species described by me. *Stigma* uncinate, thick, and fleshy. *Seed vessel* (not seen.)

4. P. *imbricatum. R.*

Stemless. *Leaves* radical. *Spikes* simple, petiolar, solitary, short-peduncled ; bractes

imbricated, truncate, many-toothed.

Page Carey Ed.

Pittuli-pata, the vernacular name in Chittagong, where it is common in its wild state. Flowers in March and April and the seeds ripen in August.

Root tuberous, &c., as in other *scitamineous* plants. *Stem* none. *Leaves* radical, long-petioled, from oblong, to broad lanceolar, tapering nearly as much at the base as at the apex, smooth, entire, finely acuminate ; twelve to twenty-four inches long, by four to eight broad. *Petioles* longer than the leaves, cylindric, smooth, the flower-bearing ones have a hairy joint near the middle, and from the joint up, a slit of between two and three inches in length opens on one side for the spike, its margins thin and hairy. *Spike* solitary, short-peduncled, simple, linear-oblong, three to four inches long, imbricated. *Bractes ; exterior* oval, truncate, with the transverse apex many-toothed, smooth, each embracing several small, pale, pink flowers, which expand in succession. *Inner bractes* small, and membranaceous. *Calyx, corol,* and *stamen,* as in P. *parviflorum. Germ* three-celled, with one ovulum in each, attached to the bottom of its cell. *Style,* as in the other species, it grows to, and is blended with the tube of the corol, its apex free, thick and hooked. *Stigma* gaping, obliquely toward the anther. *Capsule* oblong, size of a large field bean, rugose, three-celled, three-valved, opening from the apex. *Seeds* solitary, sitting on a partial aril, and attached to the bottom of the cell ; external tunic hard, brown, and polished. *Perisperm* conform to the seed. *Embryo* erect, simple, the apex hooked. *Radicle* inferior, close to the umbilicus of the seed. I. 7

Obs. The simple, short-peduncled, imbricated, linear-oblong spike, bursting from the middle of the petiole, readily points it out.

5. P. *parviflorum. R.*

Stemless. *Leaves* radical. *Heads* of flowers petiolary ; *bractes* acute.

A native of the eastern parts of Bengal. With P. *capitatum,* it blossoms about the beginning of the rains.

Root tuberous, horizontal, hairy, in other respects as in P. *capitatum,* &c. *Leaves* long-petioled, elliptically-oval, polished, entire, short, acute, pointed. *Heads* of flowers sub-globular, sessile, always bursting from the inner side of the petioles, near, or above their middle, composed of many, imbricated sessile, distichous, compact, simple, or compound spikes. *Bractes ;* the *exterior* two are broad-ovate, and common to the whole head ; the rest within smaller ; all are smooth, and end in a small, rigid, acute point. *Flowers* in pairs, small, nearly inconspicuous, yellow. *Calyx, corol, and stamen,* as in *capitatum. Germ* short-pedicelled, smooth, but hairy round the insertion of the calyx, three-celled, and in this species I have only found one of the cells fertile, in it is one ovulum, attached to the bottom of the cell. In *capitatum* all the three cells are fertile. *Style* as in the other species, it grows to the tube of the corol, its apex free and hooked. *Stigma* infundibuliform. I. 8

6. P. *capitatum. Linn. sp. pl. ed. Willd.* 1. 17.

Stemless. *Leaves* radical, long-petioled, oblong. *Heads* of flowers petiolary and terminal, glomerate. *Bractes* truncate, incurvate.

Naru-killa. *Rheed. Mal.* 11. *p.* 67. *t.* 34.

Phyllodes *Placentaria. Lour. Cochin Ch.* 16. 17.

Kudali. *Beng.* which also signifies a *Plantain.*

A native of Chittagong, and of various other parts of India. From the former place it was sent to the Botanic garden at Calcutta, by Dr. Buchanan in 1797. Flowering time the rainy season, the seeds ripen in the cool season.

Root perennial, tuberous like ginger, with long, fleshy fibres from the crown, and various other parts. *Stem* none. *Leaves* radical, long-petioled, oblong, entire, smooth on both sides ; from six to eighteen inches long, and broad in proportion. *Veins* numerous, fine and parallel. *Petioles* longer than the leaves, slender, round, smooth, taper a little from the base, and are there expanded into a sheath for those immediately within ; such as are destined to bear the flowers have a joint a little above the middle ; immediately above this joint there is a swelling, which in due time is forced open on the inside by the growing flowers exactly as in our Indian species of *Pontederia.* It however sometimes appears, and even in the same plant, that some of the petioles, now scapes, extend no further than the flowers. *Flowers* numerous, collected into a pretty large, sessile head, which bursts from the anterior margin of the jointed petioles, small, and nearly hid among the large bractes ; when they first expand in the morning rose-coloured, gradually becoming purple by the evening. *Bractes,* calyx of Loureiro's *Phyllodes,* several, collecting the small sessile flowers into several fasciculi of two, three, or four pair, each of which expand in succession. The exterior one of each fascicle is large, sub-cylindric, of a firm texture, and reddish colour ; apices truncate, with scariose, incurved margin ; the rest are smaller, and more or less pointed. *Calyx* superior, three-leaved ; *leaflets* ensiform, length of the tube of the corol, hairy about the points. *Corol* one-petalled. *Tube* funnel-shaped, scarcely perforated. *Border* double ; *exterior* of three, equal, purple, spatulate, recurvate segments ; *interior* more elevated as a continuation of the tube, and consists of five, very unequal segments ; the exterior two larger, round, curled, and of a pale rose colour ; the innermost one small, and running down the side of the filament like a wing. *Filament* solitary, short, inserted on the mouth of the tube close by the free, curved end of the style. *Anther* simple ; grains of the pollen white, large, and spherical. *Germ* inferior, oblong, very short pedicelled, hairy, three-celled, with one ovulum in each, attached to the bottom of its cell. *Style* growing to, or blended with the tube of the corol. *Stigma* large, funnel-shaped, obliquely-incurved or hooked towards the anther. *Capsule* short, turbinate, three-sided, pretty smooth, size of a gooseberry, three-celled, three-valved, opening from the apex. *Seed* solitary, nearly I. 9

Page Carey Ed. round, smooth, dark grey, resting on a small, squamiform aril, which is attached to and surrounds the short umbilical cord which unites the seed to the bottom of the partition. *Integument* double; *exterior* spongy, *inner* thin and rather hard, adhering to the exterior, and to the perisperm. *Perisperm* conform to the seed, horny, tinged with pale blue; a fissure replete with a brown substance penetrates from the base to a considerable distance upwards. *Embryo* pure white, hooked, with the convexity upwards, which corresponds with the periphery of the seed.

HEDYCHIUM. Kön.

Corolla with a long, slender tube; both borders three-parted; inner resupinate. *Anther* double, naked. *Capsule* three-celled, three-valved. *Seeds* numerous, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

1. H. *coronarium. Linn. sp. pl. ed. Willd.* i. *p.* 10. *König in Retz. Obs.* 3. 73.

Leaves lanceolate. *Spikes* compactly imbricated; *segments* of the cleft lip of the corol semi-lunar.

Gandsulium. *Rumph. Amb.* 5. *t.* 69. *f.* 3.

Goruk-natha of the Bengalees, also by them called Doolala-champa.

A native of various parts of Bengal and the neighbouring provinces. Flowers during the rains; and the seeds ripen in the early part of the cool season.

Root horizontal, perennial, round, fleshy, marked with annular cicatrices, about as thick as a man's thumb, fleshy, with fibrous ramifications issuing from the cicatrices; taste simply herbaceous. *Stems* erect, from three to four feet high, round, every where covered with the sheaths of the leaves. *Leaves* sessile, alternate, bifarious, lanceolate, tapering to an evanescent point; above, a deep smooth green; below, striated, pale, and slightly covered with depressed, soft, white hairs; from nine to twelve inches long, and about two broad. *Sheaths* smooth on both sides, striated, terminating in a ligulated process, (as in many of the grasses) which is often two-parted. *Spike* terminal, solitary, erect, linear-oblong, about
I. the size of the thumb, compactly imbricated with many large, oval, concave, green, com-
11 mon, permanent bractes. *Flowers* large, pure white,* very fragrant, from two to four to each common bracte, but seldom more than one or two expand at the same time. *Bractes;* besides the common exterior ones, already mentioned, there are as many interior as there are flowers in the fascicle; the largest of which is about half the length of the common bracte, and envelopes not only the most forward (exterior) flower, but all those of the same fascicle, gradually diminishing in size; all have a sheathing base, are membranous, and striated. *Calyx* superior, one-leafed, a little inflated, contracted at the mouth, a little hairy, striated, half the length of the tube of the corol. *Corol* one-petalled. *Tube* long and slender, from the apex of the exterior bractes recurved. *Border* flat, double. *Exterior* three-parted; *divisions* equal, lanceolate, acute, membranaceous, striated. *Interior* resupinate, three-parted; *lower* two divisions obliquely oval, short-clawed; *upper* division broad, obcordate, banner-like, with the fissure deep, and the lobes roundish; margins waved; towards the base tinged yellow. *Nectary* (of König and Retzius) two short, fleshy, subulate bodies embracing the base of the style. *Filament* from the lower margin of the mouth of the tube, between the insertions of the inner border of the corol, ascending; upper side channelled for the style, and inserted into the anther a little above its base. *Anther* linear, sub-erect, two-lobed. *Germ* obsoletely three-sided, three-celled, with many ovula in each, attached to the axis. *Style* slender, in length sufficient to elevate the large, hairy, perforated, glandular, green *stigma* just about the apex of the anther. *Capsule* oblong, three-celled, three-valved, opening from the apex; inside orange coloured. *Seeds* many in each
I. cell, invested in their proper, multifid, crimson aril. *Integuments* two. *Perisperm* and
12 *vitellus* together conform to the seed; the former occupies the lower and exterior portion; and the latter the upper and interior portion, and is in immediate contact with the embryo. *Embryo* simple, subcylindric, nearly as long as the seed.

Obs. This, to me, is the most charming of all the plants of this natural order that I have yet met with; the great length of time it continues to throw out a profusion of large, beautiful, fragrant blossoms, makes it particularly desirable.

2. H. *flavum. R.*

Leaves broad-lanceolar. *Spikes* terminal, imbricated. *Bractes* about four-flowered: *interior* two segments of the corol linear; *lip* obcordate, with apex deeply retuse.

A native of the vallies amongst the hills near Silhet, where it is called Kattia-rityam by the natives. *Flowering* time the rainy season.

Root tuberous, like that of most other *Scitamineæ. Stems* erect, two or three feet high, and rather stout. *Leaves* lanceolar, very fine pointed, smooth on both sides. *Sheaths* smooth, with a very large, smooth membranaceous stipula rising far above the mouth. *Spike* terminal, solitary, erect, oblong, imbricated; from six to eight inches long. *Flowers* numerous, large, yellow, resembling those of H. *coronarium*, fragrant. *Bractes; exterior* between oval and oblong, rather obtuse, smooth, finely nerved, three or four-flowered, about two or two and half inches long and nearly one and a half broad. *Interior*, one to each flower, and much smaller. *Calyx* superior, nearly as long as the tube of the corol, membranaceous, inflated, obliquely two or three-toothed. *Corol; tube* slender, length of the exterior bractes, all the five *proper* segments of the border linear, the inner two more deeply

* A variety deeply tinged with yellow, is found in some of the interior provinces; and another of a pale yellow: all are equally fragrant.

coloured and obtuse. *Lip* or sixth segment, obcordate, deeply retuse, placed on the interior or upper side opposite to the filament. *Filament* linear, and together with the two-lobed *anther* about as long as the lip. *Germ* hairy, three-celled, with numerous ovula in each, attached to the inner angle. *Style* length of the corol *Stigma* large, and villous. *Capsule* turbinate, size of an olive, smooth, when ripe yellow, three-celled, three-valved. *Seeds* a few, smooth, bright deep red, with a partial ragged aril of the same colour. *Embryo* simple, sub-lanceolate, furnished with both perisperm and vitellus.* Page Carey Ed. I. 13

3. H. *angustifolium. R.*

Leaves linear-lanceolate. *Spikes* open; *fascicles* of flowers subtern, segments of the cleft lip oblong; the other five segments of the corol linear.

Beng. Bhoo-ada.

Native of Chittagong, Silhet, and the eastern parts of Bengal, where it flowers about the beginning of the rains, in June.

Root tuberous, horizontal, jointed, &c., as in the other scitamineous plants. *Stems* erect, from three to six feet high, entirely invested in the sheaths of the leaves. *Leaves* bifarious, sessile on their smooth sheaths, narrow-lanceolate, very fine, I may say filiform, pointed, smooth on both sides; from ten to fourteen inches long, by one to two broad. *Spike* terminal, erect, rigid, from six to eighteen inches long, smooth. Fascicles of flowers generally three-fold, and spreading out considerably from the rachis. *Bractes; exterior* of the fascicle cylindrical, linear; *interior,* one to each flower, and smaller. *Flowers* rather small, dull red *(lateritius,)* generally about four in the fascicle, and expanding in succession. *Calyx* superior, cylindric, length of the tube of the corol; mouth equally three-toothed. *Corol; tube* slender, cylindric, about an inch long; five segments of the border linear (sub-filiform,) variously revolute. *Lip* lateral, with linear, channelled and two-parted *lamina;* the segments thereof semi-oval. *Filament* opposite to the lip, and twice its length, nearly straight, filiform, grooved for the style. *Anther* two-lobed, naked. *Germ* oval, a little hairy, three-celled, with many ovula in each, attached to the axis. *Style* filiform, its base embraced by the usual two subulate bodies. *Stigma* funnel-form, projecting from the apex of the anther. I. 14

Notwithstanding the opinion which the distinguished Botanist Edwards (in his *Bot. Regist.*) has expressed, I am led to suspect that H. *coccineum* of Sir J. Smith (*Rees's new Cyclopædia,* in loco) is a distinct species, of which I have examined the original drawing, left by my inestimable friend and predecessor, Dr. F. Buchanan at the Botanic garden at Calcutta.

4. H. *gracile. R.*

Leaves lanceolar. *Spikes* terminal, open; *flowers* solitary scattered; segments of the bifid, sessile lip, semi-lanceolar, the other five segments of the corol linear.

Khasee name, *Kattia Laphya.*

Obs. This is a slender species, about three feet in height, a native of the mountains on the North-East border of Bengal. Like the preceding two species it flowers in the rainy season. Its solitary-flowered spike of white corols with their scarlet filament, and its lanceolar leaves, distinguish it from H. *angustifolium.*

KÆMPFERIA. Linn. gen. pl. ed. Schreb. No. 9.

I. 15

Corolla with a long, slender tube, and both borders three-parted. *Anther* double, with a two-lobed crest. *Capsule* three-celled, many-seeded.

1. K. *Galanga. Linn. sp. pl. ed. Willd.* 1. 15.

Leaves sessile, round-ovate-cordate. *Spikes* central. *Upper segments* of the inner border of the corol oval.

Katsjula Kelengu. *Rheed. Mal.* 11. *p.* 81. *t.* 41.

Alpinia sessilis. *Kön. in Retz. Obs.* 3. *p.* 62.

Soncorus. *Rumph. Amb.* 5. *p.* 173. *t.* 69. *f.* 2.

Sans. Chundra-moolika.

A native of various parts of India, and common in gardens also. Flowering time the rainy season.

Root biennial, tuberous, with fleshy fibres from the tubes. *Stem* none. *Leaves* radical, petioled, spreading flat on the surface of the earth, round-ovate-cordate, between acute and obtuse; margins membranaceous, and waved; upper surface smooth, deep green; below taper and somewhat woolly; streaked lengthways with ten or twelve slender lines. *Petioles* hid in the earth; in short they are only cylindric sheaths embracing those within, and the fascicle of flowers, their mouths being crowned with a membranaceous process. *Flowers* collected in small fascicles, from six to twelve, within the sheaths of the leaves, expanding in succession; pure, pellucid white, except a purple spot on the centre of each of the divisions of the inner border, or lip. *Bractes* three to each flower; a larger exterior; and two within at the sides; all are linear, acute, membranaceous, and half the length of the

* In January 1807 I received roots of this most charming species from Mr. Smith at Silhet, which produced blossoms in the Botanic garden in October the following year. It differs from H. *coronarium* [illegible] in the flowers, which are about one third smaller, in the inner segments of the corol linear clavate, the fissure of the lip narrow with straight sides, and its base contract into a linear [illegible]. They possess a similar fragrance, but [illegible] the peculiar fragrance of the latter, only in a less powerful and therefore more grateful degree. In stature and leaves both species are alike.

Page Carey Ed I. 16 tube of the corol. *Calyx* length of the bractes. *Corol ; tube* long, filiform ; *border* double, both three-parted. *Exterior* divisions linear, acute ; *interior*, upper two divisions ovate, erect ; under one expanding, two-parted, with lobes bifid. *Filament* short, apex two-parted, and recurved. *Anther* replete with white pollen, crowned with a bidentate crest, or continuation of the filament above the anther. *Stigma* funnel-shaped. *Nectarial* filaments of König two, filiform, erect, pretty long, embracing the lower part of the style. *Pericarp ;* I never saw it ripen.

Obs. The roots possess an agreeable, fragrant smell, and somewhat warm, bitterish, aromatic taste ; the Hindoos use them not only as a perfume, but also medicinally. They are unknown to our best judges in London.

2. K. *rotunda. Linn. sp. pl. ed. Willd.* 1. 15.

Leaves oblong, coloured. *Spike* radical, appearing before the leaves. *Upper segment* of the inner border of the corol lanceolar, and acute.

Malan-Kua. *Rheed. Mal.* 11. *p.* 17. *t.* 9.

Sans. Bhoo-chumpuca. See *Asiat. Res.* iv. 242.

Beng. and *Hind.* Bhooi-champa or Bhoo-champa.

This elegant plant is very generally found cultivated in gardens on account of the beauty and fragrance of its flowers, and though no doubt a native of various parts of India, yet I cannot say where it is indigenous. Flowering time in our gardens March and April, at which period the plant is totally destitute of leaves.

Root biennial, tuberous. *Stem* none. *Leaves* radical, petioled, oblong, waved, smooth, generally coloured underneath ; about a foot long in a good soil, and from four to six inches broad. *Petioles* sheathing, united into a short stem, as in *Curcuma. Scapes* just sufficient to elevate the flowers above the earth, embraced by a few common sheaths, of a greenish purple colour. *Flowers* sessile, from four to six to the scape, or spike, very large, fragrant ; colour of various shades of purple, and white. *Bractes* two to each flower, surrounding the base of the germ ; the inner one has its apex two-parted ; the exterior, or longest is here only about half the length of the calyx. *Calyx* above, one-leaved, as long I. as the tube of the corol, somewhat gibbous ; apex generally two-toothed, and of a dotted, 17 purplish colour. *Corol ; tube* long, slender, cylindric, nearly erect, obliquely funnel-shaped towards the mouth ; *border* double, both three-parted. *Exterior* divisions drooping, linear, with margins involute, pure white. *Interior* border, the two uppermost divisions erect, lanceolar, acute ; colour also white, with the margins slightly tinged with purple ; the remaining inferior one is divided into two broad, obcordate, deflected lobes, of a deep purple colour, particularly towards the centre, and base. *Nectarial filaments* of König as in K *Galanga. Filament* short, erect, broad, inserted on the base of the uppermost two interior divisions of the corol. *Anther* linear, and enlarged with an ovate, two-forked, coloured, somewhat recurved crest *Germ* ovate. *Style* filiform. *Stigma* funnel-shaped.

Obs. Woodville observes, at page 362 of his *Medical Botany*, that the roots of *Zedoaria longa*, and *rotunda* are both produced by the same species of plant, and are indiscriminately used in the shops : the former, he says, are brought to us in oblong pieces, about the thickness of the little finger ; two or three inches in length, bent, rough, and angular ; the latter are roundish, about an inch in diameter, of an ash colour on the outside, and white within. I have never met with any of the roots of this plant that agree with his description of the long sort, and they are too small for the round ; so that I must conclude they are the produce of some other plant : at the same time Dr. Woodville's observations on the same page, give me reason to think my *Curcuma Zedoaria* may be the plant, which yields this round sort of *Zedoaria.*

3. K. *angustifolia. R.*

Leaves radical, linear-lanceolate, waved. *Spikes* hid in the centre of the leaves. Upper two segments of the inner border of the *corol* linear, oblong, obtuse.

Hind. Kunjan-boora, also Madu-nirbisha.

I. A native of Bengal. Flowering time the rainy season.

18 *Root* biennial, tuberous, with numerous ramous fibres from every part. *Stems* none. *Leaves* radical, numerous, sessile, linear-lanceolate, keeled ; *margins* entire, and much waved ; striated lengthways, with darker and lighter coloured green, smooth in every part ; from six to eight inches long, and about one broad. *Spikes* hid in the centre of the leaves, bearing from four to six large, beautiful flowers in succession. *Bractes* two or three to each flower ; one or two interior embrace the germ laterally, the exterior one is larger, all much pointed, and of nearly the same length. *Calyx* superior, one-leaved, half the length of the tube of the corol, opening obliquely, (spathe-like,) near the apex, which is a single acute point. *Corol ; tube* very long, and slender, elevating the border about two inches above the earth ; *border* double, &c. ,as in K. *rotunda. Nectarial filaments* of König, *stamens*, and *pistil* as in the last quoted species.

Obs. The root is used as a medicine for cattle, by the people of Bengal.

4. K. *pandurata. R.*

Leaves petioled, broad-lanceolate, smooth. *Spike* central. *Corol*, with the upper segments of the inner border obovate, the inferior one much larger, and panduriform.

Zerumbet *claviculatum. Rumph. Amb.* 5. *p.* 172. *t.* 69. *f.* 1 ; and I could almost wish to quote Manja-kua, *Rheed. Mal.* 11. *p.* 19. *t.* ii., although referred to already by Linnæus for *Curcuma rotunda*, a plant I have never met with, if this be not it.

From Sumatra, this beautiful plant was sent by Dr. Charles Campbell to the Botanic garden at Calcutta, where it blossoms during the rains, chiefly in August.

Root perennial, tuberous like ginger, but of a tolerably bright yellow colour; from this straight, slender, fusiform, paler coloured portions descend deep into the soil. *Stems* scarcely any; height of the plant about a foot and a half. *Leaves* bifarious, petioled, oblong, acute, smooth; deeper green on the upper surface; *veins* parallel, and pretty conspicuous, from six to twelve inches long. *Petioles* above the bifid ligula, deeply channelled, and from two to six or eight inches long; the lower portion sheathing, and forming something like a stem. *Spike* hid in the centre of the sheaths of the leaves, unilateral, being imbricated on one side, (say the anterior,) with many, sessile, slender, lanceolate, colourless, one-flowered pairs of (*exterior* and *interior*) scales or bractes. *Flowers* pretty large, expanding in succession, and rarely more than one at a time. *Calyx* superior, membranaceous, irregularly three-toothed. *Corol; tube* long, and slender. *Border* double; *exterior* of three, slender, lanceolate, nearly equal, straight pale pink-coloured segments; *inner* of three unequal portions; the two superior, or lateral, obovate, the colour and length of the exterior three: the lower, or lip, somewhat panduriform, much broader and longer than the former, and of a much deeper colour. *Filament* very slender. *Anther* two-lobed, and crowned with an emarginate, recurved helmet. *Germ* three-celled, each cell containing many ovula, attached to the axis. *Stigma* large, with a semilunate opening, which has the straight portion of its margin three-toothed, and the semi-circular one even. *Nectarial* scales long and slender. Page Carey Ed. I. 19

5. K. *ovalifolia. Roxb.*

Leaves oval. *Spikes* central, crest of anthers laciniate.

A native of the peninsula of Malacca, and from thence sent, by Major Farquhar, to the Botanic garden at Calcutta, where it blossoms in July. It is an intermediate species, both with respect to size and habit, between K. *Galanga* and *rotunda*, and ought to be placed between them in the system.

Root tuberous, as in the other species, and about biennial. *Stems* very short; I may say scarcely any. *Leaves* few, bifarious, patent, oval, with a short acute point, smooth on both sides, about six inches long, by four broad. *Spikes* central, hid by the short sheaths of the leaves, few-flowered; the flowers expand in succession, all pure white except the purple lip. *Corol* nearly as in *rotunda* and *angustifolia*, the upper two segments of the inner border are obtusely lanceolate, as in the latter: the *lip* or *nectarium* of a deep variegated purple colour, the shape cuneate-obcordate, and divided from the apex nearly half the length into two long emarginate lobes. *Filament* short. *Anther* two-lobed, and crowned with a large, laciniate, erect, white crest. *Germ* three-celled, &c., as in the genus. I. 20

CURCUMA. Linn. gen. pl. ed. Schreb. No. 8.

Corolla with both borders three-parted. *Anther* double, base bicalcarate. *Capsule* three-celled; *seed* numerous, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

SECT. I. *Spikes lateral.*

1. C. *Zerumbet. Roxb. Ind. pl.* 3. N. 201.

Bulbs and *palmate tubers* pale straw-coloured throughout. *Leaves* green, petioled, broad-lanceolar, a dark purple cloud down the middle. *Flowers* shorter than their bractes.

Sans. Shutee, Gundha-moolee, Shud-grunthhika, Kurvoora, Kurchoora, and Pulasha.

Hind. and *Teling.* Kuchoora.

Beng. Shuthee, Kuchoora.

Pers. Zerumbad.

Kua. *Rheed. Mal. vol.* 11. *p.* 13. *t.* 7.

Zerumbed. *Rumph. Amb.* 5. *p.* 168. *t.* 68.

Amomum *Zerumbeth. Kön. in Retz. Obs.* 3. 55.

Zerumbet, or Cachora of *Garcias.*

The plants from which the following description was taken, were sent by Dr. F. Buchanan, from Chittagong, where they are indigenous, to the Botanic garden at Calcutta, in 1798, where they grow freely, and blossom in the month of April. Others have since been procured from thence under the Bengalee name Kuchoora. From that place the native druggists in Calcutta, are chiefly supplied with the root or drug. I. 21

Root consists, as in all the other species of this genus, of ovate bulbs, giving support to the parts above ground; from their opposite sides spring the palmate tubers; these two sorts are inwardly of a pale yellow, or straw-colour, and possess an agreeable camphoraceous smell, and warm bitterish, spicy taste. From the bulbs chiefly, the proper fibrous roots issue: some of these are thicker than others, penetrate deeper into the soil, and end in an oblong, pearl-coloured, solid tuber; which is more spongy and less fragrant when cut, than the bulbs and palmate tubers. *Stems* no other than the united sheaths of the leaves, surrounded by two or three obtuse, smooth, green, faintly striated, appressed scales. Height of the whole plant about three feet, or three and a half. *Leaves* from four to six together, sub-bifarious; in general a pretty long, somewhat winged petiole intervenes between each and its stem-forming base. The leaf itself is broad-lanceolar, fine-pointed, and smooth on both sides; constantly a dark purple cloud runs down the centre; *veins* numerous, fine and parallel; from one to two feet long. *Scape* rises distinct from the leafy stems, and rather before or with them, short, from five to six inches long, and surrounded with a few, obtuse, lax, green sheaths, of various length. *Spike* tufted, from four to five inches long, (so that

Page Carey Ed. its apex is elevated nearly a foot above the surface of the earth;) covered with imbricated, oblong, concave bractes, connected by the lower half of their inner margins to the backs of those immediately above, forming as many sacks, or pouches as there are bractes; the lower half of these are broad, shorter; scarcely tinged with red, containing each about three or four beautiful, yellow, sessile flowers, which expand in succession, and are em-
I. braced laterally by their own proper, smaller, short, colourless bractes. The superior half
22 of the large coloured ones, which form the tufts, are generally sterile, and of a deeper crimson, or purple colour, than those which contain flowers. *Calyx* superior; scarcely one-third the length of the corol, irregularly three-toothed, pellucid. *Corol* funnel-shaped. *Tube* a little curved. *Border* double; *exterior* three-parted, the two lateral segments equal; the third or upper one vaulted and crowned with a subulate point; *colour* a very faint yellow. *Interior* three-parted; lower segment, or lip, broad, deep yellow, projecting, recurved, bifid; upper or lateral segments obovate, equal, pale yellow, nearly as long as the lip. *Filament* short. *Anther* double, the lower end of each lobe terminating in a long, sharp, subulate spur. *Germ* beneath, hairy, three-celled, with many ovula in each, attached to the inner angle of the cell. *Style* slender at the base, embraced by the two nectarial filaments. *Stigma* two-lobed, crowning the anther. *Capsule* oval, smooth, of a pale straw-colour, thin and nearly pellucid; three-celled, but without any regular division into valves: when the seeds are ripe the elasticity of the segments of the arils bursts the vertex into various portions, from whence the seeds are soon expelled. *Seeds* several in each cell, arilled; shape various, but the most prevailing is oblong. *Aril* cut to the very base into several slender, unequal, white, fleshy segments, which are united to the seed round the umbilicus. *Integuments* two; *exterior* spongy, with highly polished slippery, light brown surface; *interior* membranaceous. *Perisperm* pure white, hard but friable, and occupies the lower half of the seed. *Vitellus* clearer, but less white and of a tougher consistence than the albumen; it forms or occupies the upper half of the seed. *Embryo* nearly as long as the seed, tending to be clavate, both ends truncate, the upper half lodged in the vitellus, and the lower in the albumen, or perisperm.

Obs. The dry root powdered and mixed with the powdered wood of the *Cæsalpinia*
I. *Sappan* makes the red powder called *Abeer* by the Hindoos, and *Phag* by the Bengalees.
23 It is copiously thrown about by the natives during the *Hooli*, or Hindoo holidays in the month of March. The root is also used medicinally amongst the natives.

In 1805, I gave some of the sliced and dried bulbous, and palmate tuberous roots of this plant to Sir Joseph Banks, which he gave to Dr. Comb, who found that it was the real *Zedoaria* of our *Materia Medica*, and by the same means ascertained that the root of my *Curcuma Zedoaria*, is *Zedoaria rotunda* of the shops.

2. C. *Zedoaria. R.*

Bulbs small, and, with the long *palmate tubers*, inwardly yellow. *Leaves* broad-lanceolar, sessile on their sheaths, cericeous underneath; the whole plant of a uniform green.

Amomum *Zedoaria, Linn. sp. plant. ed. Willd.* i. *p.* 7.

Sans. Vuna-hurídra, Sholee, Vunarista, Sholíka.

Beng. Junglee, or Bun Huldi, (wild turmeric.)

Arab. Jedwar, or Zadwar.

This beautiful species is a native, not only of Bengal, (and common in gardens about Calcutta,) but is also a native of China, and various other parts of Asia, and the Asiatic islands. Flowering time the hot season, the leaves appear about the same period, or rather after; for it is not uncommon to find the beautiful, large, rosy, tufted spikes rising from the naked earth before a single leaf is to be seen.

Root biennial, tuberous, &c., as in the last, and inwardly of a pretty deep yellow colour, approaching to that of *turmeric*. *Stem* no other than the sheaths of the leaves. *Leaves* petioled, broad-lanceolar, entire, underneath covered with soft cericeous down, which is particularly conspicuous when the leaves are dry. The *scape* rises distinct from the leaves during the dry season, and often not only at some distance, but also sometime before them; it is round, as thick as a man's fore finger; a few inches long, and embraced by its own
I. short, proper, green sheaths. *Spike* from six to twelve inches long, &c. exactly as in the
24 last species. *Bractes* and *calyx* as in the before-mentioned species. *Corol* one-petalled; at the base tubular. *Tube* short, widening a little; its mouth shut with fine yellow pubescent glands; *throat* ample. *Border* double; *exterior* of three pale pink-coloured, erect, oblong divisions; the upper one more pointed, and incumbent over the anther and part of the two upper divisions of the inner border. *Interior* somewhat ringent, three-parted, fleshy, yellow; the lower lobe or lip longest, obovate, entire, projecting with a crown and erect margin, while a broad elevation of a deep yellow colour runs along its middle; upper two divisions obovate, and with the upper segment of the exterior border, forming a complete covering or dome over the anther. *Filament* short, inserted between the two upper divisions of the inner border of the corol. *Anther* two-lobed, each ending in a long, sharp spur at the base. *Germ* inferior, &c., as in the last. *Style* filiform. *Stigma* three-lobed, with a perforation in the centre.

Obs. The plant when in flower is highly ornamental, few surpassing it in beauty; at the same time it possesses a considerable degree of delicate aromatic fragrance.

Dr. Woodville's observation and quotations, at page 362 of his *Medical Botany*, induce me to think that the roots of this plant are not only the longer species of the *Zedoaria* found in the shops; but also the shorter or roundish, their form and size depending on the manner in which they may have been cut for drying: and I have lately learned from Sir J.

Banks, that the dried root of this species agrees well with *Zedoaria rotunda*. Page Carey Ed.

The Hindoos use the roots as a perfume, and also medicinally; they are sold in their shops, under the Arabic name *Judwar*, or the Bengalee one of *Bun Huldi*. When fresh as well as when dry, they are of a pale yellow colour; and possess at all times an agreeable fragrant smell, and warm, bitterish, aromatic taste; whereas the roots of *Kæmpferia rotunda* possess little or nothing of these sensible qualities, and are withal too rare in every part of India, where I have been, to allow me to think, any quantity of them can ever be collected for exportation. I. 25

3. C. *zanthorrhiza*. *R.*

Bulbs ovate, with both palmate and pendulous tubers deep yellow. *Leaves* sessile on their green sheaths, broad lanceolar, a permanent purple cloud down the middle.

From Amboyna, this remarkable species was brought to the Botanic garden at Calcutta, in the year 1798, and only flowered for the first time in April and May, 1810. It is the only kind I have yet met with, which has its pendulous tubers inwardly of a deep yellow colour, like that of the bulb and palmate tubers. The *sheaths* of the scapes and leaves are green. The *coma* large, and of a deep purple, or crimson colour. *Exterior border* of the corol red. *Leaves* broad-lanceolar and oblong; there is a narrow purple cloud down the middle of them, which penetrates to the under side; the whole height about four feet.

4. C. *elata*. *R.*

Bulbs oblong, obovate, and with the numerous, large, incurvate, palmate tubers, inwardly of a pale yellow. *Leaves* sessile on their sheaths, oblong, villous underneath; the whole of an uniform green.

A native of Burma, and from thence introduced by Dr. W. Carey, into the Botanic garden at Calcutta, where it flowers in March and April.

A full description of this species is unnecessary, as it resembles the other species already described, in every respect, except, in such as are pointed out in the definition, viz, its immensely large and numerous *bulbs* and *tubers*, which are inwardly of a pale yellow colour; the latter run very near the surface of the ground, and are much incurved. The *pendulous tubers*, as in every other species, except C. *zanthorrhiza*, are inwardly pearl-coloured; every part above ground is of a uniform green, the spikes excepted. The *leaves* appear when the flowers begin to decay, and are larger than in any other species I have yet seen; being from two to three, or even four feet long, by one broad, and villous underneath; the whole height is about six feet. The *spikes* are large, with a deep rosy, or even crimson coma. Its external appearance resembles most C. *Zedoaria*, the roots however differ much, independent of their size. This plant is altogether a larger species than that. I. 26

5. C. *cæsia*. *R.*

Bulbs ovate, and with the *palmate tubers* inwardly bluish. *Leaves* lanceolar, petioled; a deep ferruginous purple cloud down the middle, which penetrates to the under surface; every other part green.

Beng. Neel-kunt'ha, or Kala Huldi.

Tommon-itam. *Rumph. Amb.* 5. *p.* 169.

This elegant, strongly marked species is a native of Bengal, where it blossoms in May, while the greatest heat prevails, just before the periodical rains begin: about the same time the leaves begin to appear. In the deep ferruginous purple cloud down the middle of the leaves, it resembles C. *Zerumbet*, but differs widely in the colour of the root.

Bulbs ovate. *Palmate tubers* many, and generally simple; these and the bulbs are inwardly pale blue, verging towards grey, (cæsius of Willdenow's scale,) in some the blue is pretty deep. *Pendulous tubers* ovate, oblong, inwardly of a pale watery pearl-colour, and less fragrant than in the former two species. This indeed is the case with all the other species I have examined. *Leaves* bifarious, petioled, lanceolar, smooth on both sides, a deep ferruginous cloud runs the whole length of the rib, and penetrates through to the underside; every other part, petioles, and their sheaths, of a clear deep green colour; about eighteen inches long, by five broad. *Petioles* and their sheaths together, about as long as the leaves, making the whole height of the plant about four feet. *Spikes* lateral, appearing with, or rather before the leaves, about as long as their scapes, together about a foot long. *Scales*, lower fertile; *bractes* green, with a ferruginous tinge. *Coma* deep bright red, tending to crimson. *Corol*; *exterior* border red; *inner* yellow. I. 27

6. C. *æruginosa*. *R.*

Bulbs ovate, and with the numerous *palmate tubers*, inwardly æruginous. *Leaves* petioled, broad-lanceolar, smooth, above the middle a faint ferruginous, evanescent cloud on the upper surface only; every other part green.

A very stately species, introduced from Burma by the Rev. Dr. W. Carey, into Bengal, where it blossoms in May, immediately after which the leaves begin to appear. It is distinguished from all our other *Curcumas* by the internal æruginous, or verdigrease-like colour of its ovate *bulbs*, and its short thick palmate *tubers*; while the oval pendulous tubers, with which it abounds, are inwardly of a clear pale pearl colour. The comose lateral *spike* is in this, as it is in the other species. The *exterior* border of the *corol* is rose-coloured; the *interior* deep yellow. The *leaves* are broad-lanceolar, of a firm texture, and smooth on both sides: from two to three feet long, and from six to nine inches broad. *Petioles* and their sheathing portions together from two to three feet long; which gives to the whole plant a height of from four to six feet.

7. C. *ferruginea*. *R.*

Bulbs and *palmate tubers* copious, inwardly pale yellow. *Sheaths* of the scapes, and

Page Carey Ed. leaves ferruginous-red, with a faint mark of the same colour on the middle of the upper surface of the leaves.

A native of Bengal. Flowers in April and May. By attending to the pale yellow very fragrant roots, and to the rusty reddish sheaths of the scapes and leaves, this species will be
I. readily known. The *leaves*, as in most of the others, are broad-lanceolar, (that is, they taper
28 equally toward each end,) including the sheaths and petioles, they are four feet high, or more; a very faint ferruginous tinge runs down the middle, which is very conspicuous in those that appear first in the season; whereas it is scarcely to be observed in the latter. The *flowers* are large, few in number, with the *exterior* border red, and the *interior* deep yellow. The *bractes* to the fertile part of the spike ferruginous, those of the *coma* few, and of a pretty bright crimson colour.

8. C. *rubescens*. *R.*

Bulbs ovate-lanceolate, and with the *palmate tubers* inwardly pearl-coloured. *Leaves* broad lanceolate, on red winged petioles, above the sheaths; *rib* red. *Scape* and *scales* red. *Flowers* longer than their bractes.

A native of Bengal. Flowering time the months of April and May, soon after which the leaves appear; and decay about the beginning of the cool season, in November. Every part has a strong, but pleasant aromatic smell when bruised, particularly the root.

Root of several, erect, solid, conical, pale straw or pearl-coloured, powerfully aromatic bulbs, which gave support to the former years foliage, and are strongly marked with the circular scars thereof; from their opposite sides, the scapes and stems of the succeeding year spring, which form similar new bulbs when those of the former year decay; but during their existence, there issues round their lower half, a number of strong fleshy fibers, many of which end in ovate or sub-cylindrical, pale white, slightly aromatic tubers, which also perish with the original parent bulb. *Stems*, as in the other species, no other than the united sheaths of the leaves, which like them, decay annually about the month of October, and appear again when the flowers begin to perish in April. *Leaves* bifarious, (six or eight of them forming
I. the above-mentioned stems, of about three or four feet in height, leaves included,) petioled on
29 their sheathing base, broad-lanceolate, cuspidate, smooth, strongly marked with parallel veins; of an uniform dark-green, with the nerves or ribs red, from twelve to twenty-four inches long, by five or six broad. *Petioles* and *sheaths* channelled, smooth, and of a deep red colour; a projecting process on the inside marks, in all this natural order, the limit of the sheath, and the beginning of the petiole. *Scape* radical, lateral, cylindric, about six inches long, invested in several, dark reddish sheaths. *Spike* tufted, five or six inches long, erect. *Coma* less deeply coloured than in Zerumbet. *Bractes*, or *scales* of the spike exactly as in the other species, each embracing four or five flowers, which expand in succession. *Flowers* small, bright yellow, rather longer than their bractes, fragrant. *Tube* of the corol slender, its mouth completely shut with three villous, yellow glands. *Fruit* not seen in a ripe state.

Obs. The ovate oblong, pendulous tubers of several species of *Curcuma*, yield a very beautiful, pure starch, like the *Arrow-root*, produced from *Maranta arundinacea* and *Tacca pinnatifida*, which the natives of the countries where the plants grow, prepare and eat. In Travancore, where some of these species abound, this flour, or starch, forms, I am told, a large part of the diet of the inhabitants. My C. *angustifolia* is another species which yields the same substance; and I have no doubt but the pendulous tubers of this species yield it also, and equally good.

Since writing the above, I have received from Chittagong, Bhagulpore, and Mirzapore, plants of three other sorts, all employed for the same purpose.

9. C. *comosa*. *R.*

Bulbs large, oval, inwardly pale ochraceous. *Spikes* clavate; *fertile bractes* of a pale pink colour; *coma* copious and rosy. *Leaves* broad-lanceolar; a faint ferruginous cloud above the middle of the earliest ones; every other part green.

I. A native of Burma. From Rangoon Mr. Felix Carey sent plants to the Botanic garden
30 at Calcutta, where they thrive well, and blossom in May, at which time it is by far the most beautiful, and the largest of the genus, I have yet seen.

Bulbs very large, oval, inwardly of a pale ochraceous colour. *Palmate tubers* scarcely any. *Pendulous tubers* lanceolar, and connected to the bulb by uncommonly long, thick, fibrous cords. *Leaves* bifarious, petioled on their sheaths, lanceolar, smooth, and green in every part, except in those which appear first in the season, which have a faint ferruginous cloud on the centre of the upper surface beyond the middle; from two to three feet long; the petioles with their sheathing bases measuring about as much more, making the whole height of the plant five or six feet. *Spikes* lateral, appearing rather before the leaves, short-scaped, large, clavate. *Fertile bractes* of a beautiful pale pink. *Barren ones* of the *coma* a deep, lively, rosy red; on account of the beauty and size of this part, I have given it the trivial name *comosa*. *Corol* with the *exterior* border pink; *inner* pale yellow.

10. C. *leucorrhiza*. *R.*

Bulbs ovate; *palmate tubers* long and far-spreading, like the former they are inwardly of a pale straw colour. *Leaves* petioled, broad-lanceolar, smooth, of an uniform green in every part. *Spikes* few-flowered, with a coma as long as the fertile portion.

A native of the forests of Bahar. From Bhagulpore Mr. John Glass, the surgeon of that station, sent roots to this garden, under the name *Tikor*; and observed that the plant is not cultivated, but grows in the jungles, to the southward of that place. The process, he says, for obtaining the starchy substance called Tikor, is as follows: "The root is dug up, and rubbed on a stone, or beat in a mortar, and afterwards rubbed in water with the hand,

and strained through a cloth ; the fecula having subsided, the water is poured off, and the Tikor, (fecula,) dried for use."

This plant grows freely in the Botanic garden, and flowers in May. Here the *palmate*, or *horizontal tubers*, are particularly straight, and often near a foot long : they run deep in the earth, and far. Their inward colour, as well as that of the bulbs, is a very pale ochraceous yellow, almost pure white. *Pendulous tubers* numerous, oblong, inwardly pearl white. *Leaves* broad-lanceolar, uniformly green, about two feet long ; whole height of the plant from three to four feet. *Spikes* lateral, the inferior fertile portion not longer than the rosy coma. *Flowers* the length of the bractes : *exterior* border slightly tinged with pink ; *inner* yellow. In the structure of the fruit it agrees perfectly with that of C. *Zerumbet*.

11. C. *angustifolia*. *R*.

Bulb oblong, with pale, oblong, pendulous tubers only. *Leaves* petioled, narrow-lanceolar. *Flowers* longer than the bractes.

Tikor of the Hindoos.

Found by H. T. Colebrooke, Esq. in the forests from the banks of the Sona to Nagpore, and by him introduced into the Botanic garden at Calcutta, where it blossoms in July. The leaves make their appearance at the same time with those of the other species, and decay about the beginning of the cool season, in November.

Root, from a fusiform biennial crown issue many fleshy fibres, which end in smooth, oval, succulent tubers. *Stem*, consisting of a few pale-coloured, leafless, surrounding sheaths. *Leaves* petioled, narrow-lanceolar, most acute, striated with fine parallel veins, smooth on both sides; from one to three feet long, (petiole and sheath included,) which is in fact the whole height of the plant. *Petioles* from six to twelve inches long, the lower half or more of which, expands into a sheath to embrace those within; the upper half or proper petioles slender, and channelled. *Spike* radical; from four to six inches long, separate from the leaves, crowned with a tuft of oval, lively purple, neuter bractes. *Bractes common* below the coloured neuter ones, ovate-cordate, obtuse, expanding recurvedly, each embracing three or four flowers, which open in succession. *Bractes proper* boat-shaped, embracing the proper perianth, and germ of each flower. *Flowers* large, longer than their bractes, bright yellow, expanding at sunrise, and decaying at sunset of the same day. *Calyx* above, three-toothed, somewhat inflated. *Corol ; tube* somewhat gibbous, contracted at the mouth, and there shut with short hairs ; *throat* campanulate ; *exterior* border pale-yellow, consisting of one large, vaulted, upper segment, and two lower, oblong, smaller, concave ones ; *inner* border three-parted ; *lower segment* or *lip* with its exterior part sub-orbicular emarginate, or bifid ; *upper segments* obovate, cuneate, with the filament, or short antheriferous segment, between them. *Anther* as in the genus, double, with a spur from the lower end of each lobe. *Germ* beneath, villous, three-celled, with many seeds in each. *Style* slender, at its insertion are the usual two nectarial bodies. *Stigma* globular, gaping on the anterior side.

Obs. From the oval pendulous tubers, Mr. Colebrooke observes, a sort of *starch* or *Arrow-root-like fecula* is prepared, which is sold in the markets of Benares, and is eaten by the natives.

SECT. II. *Spikes central.*

12. C. *longa*. *Linn. sp. pl. ed. Willd.* 1. 14. *Retz. Obs.* 3. 72.

Bulbs small, and with the numerous, long, *palmate tubers*, inwardly of a deep orange yellow. *Leaves* long-petioled, broad-lanceolar, of an uniform green.

Amomum *Curcuma*. *Gmelin.* and *Jacq. Hort. Vind.* 3. *t.* 4.

Manjella-kua. *Rheed. Mal.* 11. *p.* 21. *t.* 11.

Curcuma domestica major. *Rumph. Amb.* 5. *p.* 162. *t.* 37.

Carcumaa of Avicenna.

Dar-zard of Garcias.

Sans. Haridra, Huldee, Peeta, Kanchunee, Nisha, Varavarnince, Krimighna, Yoshitpriya, Harivilasinee.

Hind. and *Beng.* Huldee, Huludee, Pit-ras.

Heb. Kurkum.

Arab. Urukus-sufr, Urukus-saboghin.

Teling. Pampee.

Pers. Zerd-chob.

Hulud, or Huludee. Mahrat.

Is much cultivated about Calcutta, and in all parts of Bengal. König's description published by Retzius, is so very exact and complete, that there is nothing left for me to add.

Cultivation.

The ground must be rich, friable, and so high as not to be overflowed during the rainy season, such as the Bengalees about Calcutta call Danga. It is often planted on land where sugar-cane grew the preceding year, and is deemed a meliorating crop. The soil must be well pulverised and cleared of weeds, &c. It is then raised in April and May, according as the rains begin to fall, into ridges, nine or ten inches high, and eighteen or twenty broad, with intervening trenches nine or ten inches broad. The cuttings or sets, viz. small portions of the fresh root, are planted on the tops of the ridges, at about eighteen inches, or two feet

Page Carey Ed. asunder. One acre requires about from nine hundred such sets, and yields in December and January, about two thousand pounds weight of the fresh root.

13. C. *Amada. R.*

Bulbs conic, and with the *palmate tubers*, inwardly pale-yellow. *Leaves* long-petioled, broad lanceolate, smooth. *Spikes* scanty, few-flowered. The whole plant uniformly green.

Amada of the Bengalees, which means *mango-ginger*, the fresh root possessing the peculiar smell of a green mango. It is used medicinally by the natives. It is a native of Bengal. Flowering time the latter part of the rains.

I. 34 *Root* consisting of horizontal, palmate, sessile tubers united to the sides of an ovate-conic bulb of the same colour, which gives existence and support to the leaves, and spike; from its sides and base long fleshy fibres issue, which penetrate deep into the soil; some of which end in oblong, paler (pendulous) tubers. *Stems* no other than the united sheaths of the leaves. *Leaves* radical, bifarious, petioled above their sheaths, ventricose, lanceolar, cuspidate, smooth on both sides; from six to eighteen inches long, by three to six broad; they decay about the end of October, and appear again with the first showers of April or May. The *petioles* I divide into two portions: the lower or sheathing part from six to twelve inches long; and the upper or proper petioles, from three to nine; the whole measuring in general, from one to two feet. *Scape* central, about six inches long, invested in several alternate sheaths. *Spike* shorter than the scape, cylindric, crowned with a tuft of loose, coloured, pale rosy, abortive bractes. *Bractes* oblong, imbricated, the lower half of their margins united to the backs of the two next above, forming a pouch, for a fascicle of four or five, rather small, yellow flowers, which expand in succession; these have each a proper bracte, which embraces the tube of the flower only, and may be called an inferior calyx. *Calyx* superior, unequally three-toothed. *Corol* with a slender *tube*; its mouth shut with three yellow hairy glands; *faux* sub-campanulate. *Border* double, both three-cleft, &c., as in the other species. *Germ* oval, hairy, three-celled, with several seeds in each attached to their central receptacles.

14. C. *viridiflora. R.*

Bulbs oblong, and with the *palmate tubers* inwardly of a deep yellow. *Leaves* long-petioled, broad-lanceolar. The whole plant, (even the spike and coma,) uniformly green.

Tammon Giring seu Giri. *Rumph. Amb.* 5. 169.

A native of Sumatra, and the other eastern islands; from Bencoolen Dr. Charles Campbell sent plants to this garden, where they grow luxuriantly, and blossom in July and August.

I. 35 *Root* consisting, like that of the other species, of *bulbs*, and palmate, pendulous *tubers*; aromatic, and bitter, and employed by the Malays of Sumatra to dye with. *Leaves* petioled, broad-lanceolar, smooth; from one to three feet long; the petioles, and sheaths thereof about as long. *Spike* central, large. *Bractes*, even those of the *coma*, uniformly green; the latter only paler. *Flowers* small, very pale yellow.

15. C. *montana. Corom. pl.* 2. *N.* 151.

Bulbs conic, with pale-yellow *palmate tubers*. *Leaves* short, petioled, oblong. The whole plant uniformly green, except the rosy coma of the spike.

It grows in moist places, amongst the Circar mountains. Flowering time the rainy season.

Root perennial, consisting of conical bulbs enveloped in the remaining sheaths of the leaves, and also of horizontal tubers, as in ginger, &c. with large fleshy fibres from their base. *Leaves* radical, three or four-petioled, their petioles from eight to twelve inches long, enveloped in a few sheaths, forming something like a stem; the leaves themselves are oval, pointed, beautifully veined, smooth, from eight to twelve inches long, and from five to six broad. *Spikes* rise from the centre of the petioles; their peduncle is of their length, and involved in its proper sheaths. *Bractes* numerous; the inferior roundish, the superior oblong; the lower half of the base of the two inner are united to the margins of the next without, forming a sack, which contains from two to four flowers, each of which has a smaller wedged-formed membranaceous proper bracte. The *coma* or *superior bractes* large, waved, rose-coloured, and (generally) without flowers. *Calyx* as in the two former species. *Tube* of the corol widening, somewhat campanulate; *border* double. *Exterior* three-parted; *divisions* equal, entire. *Interior* two-lipped; *upper lip* erect, three-cleft; *under lip* entire,

I. 36 roundish, border waved, and a little notched. *Filament* no other than the middle segment of the upper lip of the interior border of the corol; *anther* two-lobed, linear, the under point of each lobe ending in a long sharp spur. *Germ* below. Base of the *style* embraced with the usual two nectarial bodies, which in this species are larger; *stigma* large, globular, two-lipped, somewhat marked.

16. C. *reclinata. R.*

Bulbs fusiform, with scarcely any *palmate tubers*, but many straw-coloured, oval, pendulous ones. *Leaves* petioled, oblong, reclinate.

Discovered by H. T. Colebrooke, Esq. in the interior parts of India, where it blossoms during the rains.

Root a bulbous head, from which descend many fleshy fibres, ending in large, smooth, oval tubers. *Stem* none, but the height of the whole plant (viz. the spike) is about six inches; the leaves, being reclined, add nothing to its height. *Leaves* radical (in the only plant at present in my possession, from which this description is taken); four in number, two on each side of the spike, embracing it closely, with the lower sheathing part of their petioles

reclined, oblong, acute ; margins slightly waved ; smooth on both sides ; length, exclusive of the petiole, about nine inches, and about four or five broad. *Petioles*, including the sheathing base, from three to four inches long, deeply channelled, and smooth. *Spike* from the centre of the leaves, its short scape entirely hid by their sheaths, the rest loosely imbricated, with large, ovate, obtuse, expanded coloured bractes : the superior sterile, and more deeply coloured as in the other species of this family ; but here, and in no other that I have yet seen, are the whole deeply coloured. *Flowers* small, of a dull dark pink colour, except the lower segment of the inner border, which is tinged with yellow. *Calyx* inflated, obscurely three-toothed, scarcely half the length of the tube of the corol. *Tube* of the corol sub-cylindric ; *throat* campanulate. The *border*, *stamen*, and *pistil*, as well as the *nectarial scales* of König, as in the other species, already described. Page Carey Ed. I. 37

17. C. *petiolata. R.*

Bulbs and *palmate tubers* few and small ; inward colour pale yellow ; *tubers* numerous, pendulous, on short fusiform fibres. *Leaves* long-petioled, oblong, ovate with the base rounded, (this is the only species known to me, in which they have this form.) The whole plant uniformly green, except the lilac-coloured coma of the spike.

A native of Pegu, and from thence sent by Mr. F. Carey to the Botanic garden at Calcutta, where it blossoms in August.

Obs. This species differs conspicuously from all my other *curcumæ* in the cordate shape of the *leaves*. The spike is central, as in the other late flowering species, its *coma* small, and of a lilac colour ; the *bractes* very perfectly united almost to the broad, reniform apex, forming uncommonly deep pouches for the small yellow *flowers*.

AMOMUM. Schreb. gen. plant. N. 3.

Corolla with the interior border unilabiate. *Anther* double, surmounted with an entire, or lobate crest. *Capsule* three-celled, three-valved. *Seeds* many, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

1. A. *cardamomum, Linn. spec. pl. ed. Willd.* 1. 8.

Leaves short-petioled, lanceolar. *Spikes* half immersed in the earth, loosely imbricated with villous, lanceolate, acute, one-flowered bractes. *Lip* with the anterior margin three-lobed. *Crest* three-lobed.

Cardamomum minus. *Rumph. Amb. p.* 152. *t.* 65. *f.* 1.

A native of Sumatra, and other islands to the eastward of the Bay of Bengal, and sent by Dr. Charles Campbell from Bencoolen to the Botanic garden at Calcutta, where it blossoms in April.

Root perennial, creeping under the surface of the soil, like that of ginger, but smaller, less fleshy, more ligneous, and white ; from which descend, and spread, many fleshy fibres. *Stems* about biennial, several rising obliquely to the height of from two to four feet, about as thick as a stout ratan, invested in the smooth, deep green sheaths of the leaves. *Leaves* alternate, bifarious, short-petioled on their smooth stem-clasping sheaths ; from broad-lanceolate below, to narrow-lanceolate at top, entire and smooth on both sides ; point long, and very fine ; from six to twelve inches long. *Spikes* radical, sessile, oblong, appearing amongst the stems, half immersed in the earth, loosely imbricated with one-flowered, lanceolate, acute, villous, nervous, scariose, ash-coloured bractes ; when old their brittle tops are often broken off. *Bractes ;* besides the exterior one-flowered ones, just mentioned, there is an inner, striated, downy, scariose, two-toothed, tubular one, (which I have sometimes considered an exterior and inferior *calyx*, and which König sometimes called an involucre,) inserted round the base of the germ. *Flowers* opening in succession, and not very conspicuous. *Calyx* clavate, tubular, downy, three-toothed, length of the tube of the corol. *Tube* of the corol, slender, and slightly incurved. *Exterior border* of three subequal pellucid divisions. *Lip*, or inner border, rather longer than the exterior great border, somewhat three-lobed, with a crenate, curled margin ; middle lobe yellow, with two rosy lines leading up to it from the mouth of the tube. *Filament* scarcely half so long as the border of the corol, incurved over the mouth of the tube. There is a slender subulate horn on each side of the base of the filament, and nearly its length. *Anther* double, large, fleshy, with a large, three-lobed, concave crest ; infundibuliform stigma rising through a deep groove between the two polleniferous lobes. *Germ* beneath, downy, and crowned with the two nectarial scales, within the base of the tube of the corol ; in this species they are short, and truncated. I. 38

Obs. The seeds are to the taste agreeably aromatic, and are used by the Malays as a substitute for the true *Cardamomum* of Malabar.

2. A. *angustifolium. Linn. spec. pl. ed. Willd.* 1. *p.* 8. I. 39

Leaves broad-lanceolate. *Spikes* elevated, linear-oblong, compact ; *clavate bractes* oblong, rather pointed. *Lip* obovate, cuneate, entire. *Crest* three-toothed.

Amomum *angustifolium. Sonnerat. it.* 2 *f.* 137.

A native of Madagascar. From the island of Mauritius Captain Tennant brought plants thereof to the Botanic garden at Calcutta, in 1802, where they grow freely, and blossom at various times of the year. Every part of the plant, when bruised, or wounded, diffuses a strong, but pleasant aromatic smell.

Root perennial, tuberous, horizontal ; strong fleshy fibres, together with runners, issue from the crown, or bulb ; by these runners the plant soon spreads, and by them it is easily multiplied. *Stems* numerous, straight, round, smooth, rising to the height of from six to ten feet. *Leaves* alternate, bifarious, sub-sessile on their sheaths, broad-lanceolate, fine-

Page Carey Ed. pointed, smooth on both sides ; from twelve to eighteen inches long, and from about four to six broad. *Sheaths* embrace about three quarters of the stem, are smooth, and rise in an obtuse process, (ligula,) above the insertion of the leaves. *Scapes* from the bulb, or base of the stem, where it unites with the root, rather slender, from six to twelve inches long, and closely imbricated with many, mucronate, smooth, sheathing scales. *Spikes* linear-oblong, about the size of a man's thumb, imbricated with similar, but larger scales than those of the scape ; the inner more deeply coloured. *Flowers* few, pretty large, and possessed of a strong spicy fragrance. *Bractes ; proper* two to each flower, linear-oblong, inserted round the base of the germ, like an inferior perianth. *Calyx* superior, deep blood red, smooth on both sides, slit two-thirds on the outside, apex obscurely three-toothed. *Corol ; tube* clavate, about as long as the bractes. *Exterior border* red, consisting of one large, erect, oblong,

I. concave segment, which protects the anther and stigma ; and of two inferior, very narrow

40 segments. *Lip* obovate-cuneate, entire, or slightly three-lobed, yellow, and about as long as the exterior border. *Filament* broad, particularly toward the base, where it has a small coloured hornlet on each side. *Anther* double, surmounted with a large, three-toothed coronet. *Germ* clavate, obscurely three-sided, three-celled, with many ovula in each, attached to the partitions. *Stigma* funnel-shaped, somewhat bilabiate. *Nectarial bodies of König* are here larger, and longer than in the other species.

3. A. *aculeatum. R.*

Leaves sub-sessile, cordate-lanceolate. *Spikes* obovate, lax, even with the ground. *Lip* oval, ventricose. *Crest* amply three-lobed. *Capsules* echinate.

A native of the Malay Archipelago. It was raised from seed sent to the Botanic garden at Calcutta by Mr. W. Roxburgh, in 1802, where the plants blossom in April and May, and ripen their seed in October and November.

Root perennial, tuberous like ginger, with many, thick, fleshy fibres. *Stems* a little recurvate, the thickness of a walking cane, slightly pubescent ; from five to ten feet high. *Leaves* alternate, bifarious, very short-petioled, cordate-lanceolate, mucronate, smooth, dark green ; generally from twelve to eighteen inches long, and from three to four inches broad. *Sheaths* half stem-clasping, villous on the outside. *Ligula* short, and of a semi-lunar shape. *Scapes* issuing from the base of the stem, under the surface of the ground, where it joins the root, diverging a little way under the surface of the earth, invested in oval, fleshy scales ; those next to the spike longer, and more pointed. *Spikes* obovate, rising obliquely among, or near the stems, just so much as to elevate its flower-bearing apex above the surface of the earth. *Flowers* numerous, and expand in succession ; prevailing colour deep orange. *Bractes ; exterior* one-flowered, linear-oblong, length of the tube of the corol ;

I. *inner* tubula with two-toothed margin, and inserted round the base of the germ, like an

41 inferior perianth. *Calyx* above, tubular, two or three-toothed. *Corol, tube* slightly incurved. *Exterior border* three-parted ; *segments* unequal, erect, oblong, obtuse, the middle one larger, concave, and incumbent over the fissure of the inner border, together forming a campanulate tube. *Lip* sub-rotund, with crenulate, curled margin, and marked with beautiful crimson spots down the middle, on the inside. *Filament* erect, with a hornlet on each side of its base. *Anther* two-lobed ; *lobes* linear-oblong, and surmounted with a broad, three-lobed crest. *Germ* inferior, three-celled, with many ovula in each, attached to the inner angle. *Stigma* funnel-shaped. *Capsule* the size of a large nutmeg, oval, (not sulcate as in König's *Amomum or Globba crispa, Retz.* 3. *p.* 50.) but thickly beset with numerous, stout prickles, three-celled, three-valved ; *valves* fleshy (not nuciform as in *Globba crispa, Rump. Amb.* 6. *p.* 137). *Partitions* membranaceous. *Seeds* many in each cell, oval, smooth, brown ; surrounded with a pale, gelatinous, sweetish-acid pulp or aril, intermixed with fine woolly filaments, and attached to a central receptacle by very slender cords, which are enveloped in the same gelatinous pulp which surrounded the seed. *Perisperm* white, cartilaginous. *Vitellus* nearly spherical, lodged about the middle of the perisperm, and of a clearer colour, and harder texture. *Embryo* sub-cylindric, the inner end, or cotyledon, lodged in the vitellus, which in some seeds it passes entirely through. *Radicle* pointing directly to the umbilicus.

4. A. *maximum. R.*

Leaves petioled, lanceolar, villous underneath. *Spikes* oval, even with the earth. *Bractes* lanceolate. *Lip* elliptic. *Coronet* of one semi-lunar lobe. *Capsules* round, nine-winged.

This plant is now growing in the Company's Botanic garden near Calcutta ; it was introduced from the Malay islands by the late Colonel Kyd. Flowering time the hot season ; the

I. seeds ripen three or four months afterwards.

42 *Root* tuberous, as in ginger, but much larger, and with large, conical bulb-like bases to the oldest stems. *Stems* nearly erect, round, and smooth ; from six to eight or more feet high, invested in the smooth, long sheaths of the leaves. *Leaves* alternate, petioled, lanceolar, and linear-lanceolar, acute, smooth above ; villous underneath, with many large parallel veins ; from two to three feet long, and about six inches broad ; when dry the under side appears to be more closely covered, with most beautiful, soft, sericeous down, than while fresh. *Petioles*, the sheathing part long, between each petiole and its leaf there is a short, somewhat triangular portion, with a stipulary process, or *ligula* at the inside of its base. *Spikes* radical, short, their flower-bearing apex being only just above the earth ; below the flowers it is covered with large, oval, concave scales. *Bractes* solitary, one-flowered, lanceolate, membranaceous, rather longer than the tubes of the flowers. *Calyx* tubular, a little gibbous, length of the tube of the corol ; mouth three-toothed. *Corol ; tube* funnel-shaped. *Exterior border* three-

parted, as usual; but here they all converge upward into one helmet over the anther and stigma, as in the *Orchideæ*. *Lip* entire, expanding, oblong, marked with a yellow stripe down the middle; *margins* waved, and crenulate. *Filament* short, from the mouth of the tube of the corol, opposite to its interior border, on each side of its insertion, is a small hornlet. *Anther* double, or two-lobed, and crowned with a beautiful, broad, semi-lunar crest. *Nectarial* bodies of König linear, fluted, and truncate. *Germ* short-pedicelled, striated, three-celled, with numerous ovula in each, attached to the inner angle, *(axis.)* *Style* slender. *Stigma* funnel-shaped, but shut transversely, except during anthesis. *Capsule* almost globular, size of a gooseberry, three-celled, three-valved, ornamented with nine, firm, short, ragged (when old and dry), membranaceous wings. Page Carey, Ed.

Obs. The seeds possess a warm, pungent, aromatic taste, not unlike that of *Cardamoms*, but by no means so grateful.

5. A. *dealbatum. R.* I. 43

Leaves broad-lanceolar, villous underneath. *Spikes* radical. *Bractes* lanceolate, obtuse, (very perishable.) *Exterior border* vaulted. *Lip* round-oval. *Crest* of one, broad, truncated lobe. *Capsules* ovate-oblong, nine-winged.

A stately species, a native of Chittagong, and other countries which form the eastern frontier of Bengal: from the former it has been introduced into the Botanic garden near Calcutta, where it grows luxuriantly, and flowers freely during the months of March and April; and the seeds ripen in September and October.

Roots perennial, tuberous, crooked, jointed, creeping, like common ginger, with strong, fleshy fibres; inward colour of the tubers pale dull yellow, and when newly cut considerably aromatic. *Stems* numerous, erect in the centre, and oblique in the circumference of the clump, from three to five feet high. *Leaves* sub-bifarious, the lower sessile on their sheaths and oblong, the superior short-petioled and lanceolar; all are very villous, and paler underneath, length from six to twenty-four inches, breadth from three to six. *Sheaths* smooth, rising in a bifid ligula above the mouth. *Spikes* radical, roundish-obovate. *Scape* short and imbricated with scales, &c. *Bractes* from ovate to lanceolate, obtuse, very perishable, pale, one-flowered. In this species there is no *inner bracte*, like an *interior calyx* attached to the base of the germ, so general in this natural order. *Flowers* numerous, large, white. *Calyx* superior, rather longer than the tube of the corol, three-cleft, and the bractes very perishable. *Corol; tube* short, the three exterior segments of the border form a vault over the anther, they are linear-oblong, and nearly equal. *Lip* broad-oval, emarginate; *margins* curled, white, with a little yellow in the centre. *Filament* short. *Anther* linear, crowned with an entire, broad, truncate, pure white crest. *Germ* short pedicelled, three-celled, &c. as in the genus. *Capsules* ovate-oblong, size of a nutmeg, nine-winged, three-celled, but I have not observed them separate into valves. *Seeds* many, shape various, but oval and ovate are most common. *Integuments* besides the aril, or its dried remains, a single, very hard, dark coloured, brittle one. *Perisperm* conform to the seed, white and cartilaginous. *Vitellus* lodged in the upper part of the perisperm, of a roundish shape, hard, sub-hyaline. *Embryo* sub-cylindric, its apex immersed in the vitellus, and its base at the umbilicus. I. 44

Obs. The seeds of this plant are insipid, whereas those of *Amomum maximum*, which is nearly allied to it, are aromatic, and pass for a sort of *Cardamom.*

6. A. *subulatum. R.*

Leaves lanceolar, smooth. *Spikes* ovate, echinated with the long subulate points of the bractes, calyx, and upper segment of the exterior border of the corol. *Lip* oblong.

A native of the lower range of mountains which skirt the plains of Bengal on the north, where it grows on the borders of the rills of water between the hills. Flowering time in the Botanic garden near Calcutta, March and April; and the seeds ripen during the rains.

Root tuberous, creeping at a small distance under the surface of the soil, &c. as in the genus, and amply furnished with numerous, strong fibres. *Stems* erect, about three or four feet high, and about as thick as the little finger. *Leaves* alternate, bifarious, sessile on their sheaths, narrow-lanceolar, finely acuminate, deep green, and smooth on both sides; from twelve to fifteen inches long, by three or four broad. *Sheaths* smooth, margins coloured and rising above the mouth into an emarginate ligula. *Spikes* radical, compact, a little elevated above the soil, obovate, size of a goose-egg, echinate with the long, subulate, pale yellow points of the bractes, inner calyx and upper segments of the exterior border of the corol. *Bractes* numerous, the *exterior* imbricated upward, obovate dark-red, smooth, long-subulate, pointed, one-flowered; *the inner, or inferior* calyx, spathiform, opening on one side. *Flowers* large, yellow. *Calyx* superior, three-cleft, segments subulate, and much longer than the tube of the corol. *Corol; exterior* border of three nearly equal segments, the *upper* one ends subulately. *Lip* oblong, often emarginate; *margins* a little curled, deeper yellow than the exterior segments. *Filament* flat. *Anther* two-lobed and crowned with an entire crest. *Germ* three-celled, with many ovula in each, attached to the thick partitions, a little removed from the axis. *Style, stigma and nectarial scales of König* as in the genus. I. 45

7. A. *aromaticum. R.*

Beng. Morung Elachi.

A native of the vallies on the eastern frontier of Bengal, where, as well as in the Botanic garden near Calcutta, it blossoms during the hot season, before the periodical rains begin; and the fruit ripens in September; the capsules are then carefully gathered by the natives, and sold to the druggists who dispose of them for medicinal and other purposes, where such spices are wanted, under the name of *Morung elachi*, or *cardamom*; though the seed vessel of this species differs in form from all hitherto described sorts of this drug; however the seeds are similar in their shape and spicy flavour.

Page Carey Ed. *Root* tuberous, running for a small extent at a small depth under the surface of the soil, &c. as in the order. *Stems* in tufts, erect, or more or less oblique according to their situation in the tuft, those in the centre being nearly erect, while on the outside they bend out considerably, all are covered with the sheaths of the leaves, general height two to three feet; duration from one to two years. *Leaves* bifarious, lanceolar, acuminate, smooth; from ten to twelve inches long, and from two to four broad. *Spikes* radical, imbricated, at first clavate, afterwards becoming roundish as the fruit advances. *Scape* from one to three inches long, hid under the surface of the earth, and embraced by numerous imbricated, sheathing scales.

I. 46 *Flowers* of a middling size, pale yellow. *Bractes; exterior* one-flowered, oblong, concave, smooth; *interior*, or inferior perianth, tubular, sheathing the germ, and lower half of the proper perianth. *Calyx* superior, cylindric, entire, or dentate, villous. *Corol* with a long, slender tube; segments of the *exterior border* sub-lanceolar, obtuse,-the upper one somewhat vaulted over the stamina, and stigma. *Lip* nearly round, and undivided, tinged with red down the middle; no spurs, or projections between it and the base of the filament. *Filament* linear, incurved. *Anther* crowned with a three-lobed crest. *Germ* villous, three-celled, with many ovula in each, attached to the axis. *Capsule* ovate, size of a large nutmeg, rather fleshy; surface somewhat rugose, three-valved, three-celled. *Seeds* several in each cell; oval, and obovate are the most prevailing forms. *Perisperm* conform to the seed. *Vitellus* nearly round, occupying a considerable portion of the upper part of the perisperm. *Embryo* clavate, length of the seed, its apex passing through the centre of the vitellus.

8. A. *sericeum. R.*

Leaves lanceolar, sericeous underneath. *Racemes* radical, sub-globular, ramous. *Lip* obovate, base calcarate.

A native of the mountains on the north-east border of Bengal, where it is also called *Dooi Kesha.* It is a stately plant, with leaves about two feet long, and of the colour and appearance of highly polished silver underneath. The inflorescence a completely compound, sub-globular raceme with the short, villous, branches thereof two or three-flowered, each flower pretty long-pedicelled and embraced during their early period with villous, oblong, membranaceous bractes, which soon perish; the calyx is more permanent, tubular, villous, and three-toothed. *Flowers* large, white, centre of the lip variegated with pink veins on a yellow ground; *exterior border* of three, nearly equal, oblong, white segments, the upper one ends subulately from an

I. 47 obtuse apex; two large spurs between the base of the lip and that of the rather long filament; *anther* of two linear lobes, crowned with a very large, curled, semi-lunar crest. *Germ* villous, nine-ribbed, three-celled, &c. as in the genus. *Capsule* long, narrow, ovate-oblong, three-celled, three-valved, surface *even* and smooth, colour a brownish red, inside deeper and brighter. *Seeds* many, obovate, black, and pretty smooth, aril white and fleshy. *Embryo* simple, erect, length of the seed, and furnished with both perisperm and vitellus.

ZINGIBER.

Corolla with the interior border unilabiate. *Anther* double, crowned with a single, horn-shaped, curved beak. *Capsule* three-celled, three-valved. *Seeds* many, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

SECT. I. *Spikes radical.*

I. Z. *officinal. Roscoe in Trans. of Linn. Soc.* viii. 348.

Leaves sub-sessile, linear-lanceolate, smooth. *Spikes* elevated, oblong; *bractes* acute. *Lip* three-lobed.

Amomum *Zingiber. Rinn. sp. pl. ed. Willd.* 1. 6.

Sans. Ardrukum, Shringuverum.

Arab. Zenjabil.

Beng. and *Hind.* Adraka, or Ada. The dry root Soontha.

Teling. Allam.

Inschi, sel *Inschi* kua. *Rheed. Mal.* 11. *p.* 21. *t.* 12.

Zingiber majus. *Rumph. Amb.* 5 *p.* 156. *t.* 66. *fig.* 1.

This plant is universally known, and cultivated over all the warmer parts of Asia; where to be found indigenous I know not. Flowering time the rainy season; but it is very rarely found in that state; nor have I ever met with the seeds.

I. 48 *Root* tuberous, biennial. *Stems* erect, and oblique, invested in the smooth sheaths of the leaves; generally three or four feet high, and annual. *Leaves* sub-sessile on their long, vaginated sheaths, bifarious, linear-lanceolate, very smooth above, and nearly so underneath. *Sheaths* smooth, crowned with a bifid stipulary ligula. *Peduncles* radical, solitary, a little removed from the stems, from six to twelve inches long, enveloped in a few obtuse sheaths, the uppermost of which sometimes end in tolerably long leaves. *Spikes*, oblong, the size of a man's thumb. *Bractes; exterior* imbricated, one-flowered, obovate; smooth, membranaceous-bordered, faintly striated lengthway; *interior* solitary, enveloping the germ, perianth, and the greater part of the tube of the corol. *Flowers* rather small, when compared with the rest of this natural order. *Calyx* superior, one-leaved, opening on one side, apex three-toothed. *Corol* with a double border; *exterior* of three, nearly equal, oblong segments. *Lip* three-lobed, and of a dark purple colour. *Nectarial* filaments of König large, subulate, fine-pointed. *Filament* short. *Anther* oblong, double, crowned with a long, curved, tapering, grooved hornlet. *Germ* oval, three-celled, with many ovula in each. *Style* filiform. *Stigma* funnel-shaped, ciliate, lodged just under the apex of the hornlet of the anther. This famous plant is too well known

to require any further description.

2. Z. *zerumbet. Roscoe in Trans. of Linn. Soc.* viii. 348.

Stems declinate. *Leaves* bifarious, sessile, lanceolar. *Spike* long-peduncled, oval, compact, obtuse. *Bractes* broad-obovate, obtuse, margins coloured. *Lip* three-lobed.

Amomum *Zerumbet. Linn. sp. pl. ed. Willd.* 1. 6.

Katou-Inschi-Kua. *Rheed. Mal.* 11. *p.* 27. *tab.* 13.

Lampujum. *Rumph. Amb.* 5. *p.* 148. *tab.* 64. *fig.* 1.

Zinziber *spurium. Kön. in Retz. Obs.* 3. 60.

Beng. Butch, or mahaburee-butch.

Found wild in the woods about Calcutta. Flowering time the rainy season, the seeds ripen in November and December.

Root biennial, tuberous, as in ginger, externally whitish; internally pale yellow, and of a bitter aromatic taste. *Stems* annual, oblique, about three or four feet high, completely invested in the sheaths of the leaves. *Leaves* bifarious, sessile, broad-lanceolate, entire, smooth, waved; *veins* numerous, slender, parallel; deep-green above, pale underneath. *Sheaths* crowned with a large, broad, membranaceous, emarginate ligula. *Peduncle* solitary, a little removed from the stems, erect, from twelve to twenty-four inches long, enveloped in imbricated sheaths. *Spikes* oval, obtuse, or with a round excavation on their apex, about the size of a goose-egg. *Bractes* (or scales of the spike) the *exterior* one-flowered, imbricated, broad-obovate, obtuse, with a broad membranaceous border; *interior* (or proper) solitary, one-flowered, enveloping the germ, perianth, and most of the tube of the corol. *Flowers* large, pale, of a sulphur colour. *Calyx* superior, one-leaved, sheathing the lower half of the tube of the corol. *Corol; exterior border* three-parted, &c. as in the genus; *interior* or *lip* broad, with the lateral lobes thereof particularly large; middle division two-parted; they are all beautifully curled, and of a pale yellow colour. *Nectarial filaments of König* as in the order. *Filament* scarcely any. *Anther* large, double, with its long, curved horn projecting over the lip. *Stigma* funnel-shaped, fringed with long, distinct hairs.

3. Z. *Cassumunar. R.*

Straight. *Leaves* sessile, linear-lanceolate. *Spikes* radical, strobiliform, oblong, acute, *Bractes* obovate, acuminate. *Lip* three-lobed.

Sans. Vuna Ardrakum.

Hind. and *Beng.* Bun Ada, (wild ginger.)

Teling. Karpushpoo, (small turmeric.)

A native of Coromandel, Bengal, and Bahar. Flowering time July and August, seed ripe in November and December.

Root perennial, tuberous, furnished with long, white, fleshy fibres, and jointed like ginger, but much larger; when fresh of a deep yellow; possessing a strong, not very agreeable, camphoraceous smell, and warm, spicy, bitterish taste. *Stems* annual, erect, round, from three to five feet high, entirely enveloped in the imbricated sheaths of the leaves. *Leaves* bifarious, approximate, sessile on their sheaths, linear-lanceolate, deep green above; villous, and paler underneath, where the nerve also is hairy like the sheaths; from one to two feet long, and about three inches broad. *Sheaths* clothed with exceedingly pungent hairs on the outside; their mouths ending in a stipulary process on each side of the insertion of the leaf. *Scapes* radical, from six to twelve inches long, invested in several oblong, downy sheaths. *Spikes* oblong, strobiliform, compact, sharp-pointed, closely imbricated with numerous obovate, acuminate, greenish ferruginous (where exposed), villous bractes. *Flowers* solitary, (that is, one to each bracte of the spike, and blossoming in succession,) large, every part of a pale, uniform, sulphur colour. *Calyx* double; the *exterior* smooth, spathiform, three-dentate one, may be considered a bracte; it is inserted round the base of the germ, which, as well as the inner, or proper *perianth*, it entirely envelopes; when forcibly expanded, oval. *Inner* or *proper perianth*, superior, one-leaved somewhat gibbous, membranaceous, three-toothed, on the outside divided nearly half way down. *Corol; tube* slender, as long as the scale of the spike; *upper division* of the exterior border boat-shaped, projecting over the stamen; *under*, two narrower and reflexed under the lip. *Lip* three-lobed; lateral lobes obliquely obovate, erect; middle lobe nearly round, with the apex emarginate, and the border slightly curled. *Stam. Anther* ending in a long, subulate, recurved beak.

4. Z. *roseum. Roscoe in Trans. of Linn. Soc.* 8. 348.

Leaves short-petioled, lanceolate. *Spikes* lax, half immersed in the earth. *Bractes* lanceolate, coloured. *Lip* entire.

Amomum *roseum. Corom. pl.* 2. *N.* 126.

Teling. Bunacatchicay.

Is a native of the northern Circars, where it flowers in the rainy season.

Root biennial, horizontal, jointed, and white; with many large fibres. *Stems* several, invested in the sheaths of the leaves, &c. as in the other scitamineous plants, about two or three feet high, leaves included. *Leaves* somewhat petioled, bifarious, lanceolate, acute, tending to one side, smooth, finely veined, about twelve inches long, and from three to four broad. *Spikes* remote from the stems, just appearing above the ground when in flower, imbricated with lax, lanceolate, reddish, one-flowered bractes. *Flowers* solitary, colour a mixture of red and yellow. *Bractes*, besides the exterior one already mentioned, there is an interior one for each flower between it and the rachis, which is linear, with an obtuse, notched apex. *Calyx* one-leaved, tubular, above, membranaceous; *mouth* toothed. *Corol; tube* cylindric, erect, considerably longer than the bractes. *Border* double; *exterior* three-parted; in this plant the two approximated divisions are above, linear, pointed, and recurved, sometimes revolute; the

Page Carey Ed. lower division stands single, and is like the superior two, linear and revolute; all are of a bright red colour. *Interior*, or *lip* single, broad, obtuse, reflexed over the superior two divisions of the exterior border. *Filament*, and *anthers* as in the other species. *Style* rather longer than the horn of the anther. *Stigma* perforated, and ciliate. Two similar awl-shaped nectarial bodies at the base of the style, are also present here.

Obs. I have not found that the natives make any use of this plant.

5. Z. *ligulatum. R.*

Leaves approximate, sessile, lanceolate. *Spikes* lax, more than half hid in the earth, obo-
I. vate. *Bractes* cuneiform. *Lip* sub-hastate.
52 A native of Hindoosthan. Flowering time in the Botanic garden the rainy season; the seeds ripen in November and December.

Root jointed, running horizontally at some depth under the surface of the earth, and furnished with long fleshy fibres from the joints; from these joints shoots rise, and by them the plant is readily propagated. *Stems* about two feet high, bending considerably to one side. *Leaves* alternate, approximate, bifarious, sessile on their sheaths, from cordate below to lanceolate toward the top of the plant, both sides smooth, and marked with paralleled veins, the under side paler green, length from three to twelve inches, and breadth about four. *Sheaths* smooth, from the mouth of each rises a remarkably large long strap, or ligula, which by the growth of the plant becomes bifid, and by age scariose. *Spikes* radical, half hid in the earth, oblong, loosely imbricated with cuneiform, pink-coloured, one-flowered, exterior scales or bractes; and the same number of inner colourless, tridentate shorter bractes; or, as they may be called, inferior perianths. *Calyx* superior, one-leaved, spathiform, about half the length of the tube of the corol, irregularly tridentate. *Corol; tube* slender, the length of the exterior scales of the spike, incurved. *Exterior border* of three, nearly equal, linear, acute, smooth, reddish divisions. *Lip* oblong, obtuse; *margins* much curled, with two expanding, more or less acute lobes at the very base; colour a pale yellow. *Filament* short; below the two lobed anther, linear, ending above in the usual long, taper, curved, grooved beak. *Germ* oval, villous, three-celled, each containing many ovula attached to a central receptacle. *Style* very slender, and so long as to elevate the funnel-shaped, ciliate stigma to an equal height with the apex of the filament. *Nectarial* scales long and slender, embracing the base of the style within the bottom of the tube of the corol. *Capsule* ovate, size of a large olive, three-sided, three-celled, three-valved, opening from the apex down the angles; inside of the cells
I. crimson. *Calyx* leathery, striated, pale, dull yellowish straw colour. *Seeds* many, oval, black-
53 ish brown; a little rugose, arilled. *Aril* white, nearly complete, and ragged at the upper end. *Perisperm* conform to the seed, cinereous. *Embryo* cylindric, central, nearly as long as the perisperm.

6. Z. *rubens. R.*

Leaves lanceolar. *Spikes* lax, half immersed in the earth. *Bractes* linear-lanceolate, straight. *Lip* narrow-ovate, entire.

A native of the interior of Bengal; from the district of Rungpore Dr. Buchanan sent the plants to the Botanic garden, where they blossom in August.

Root tuberous, &c. as in the other species. *Stems* herbaceous, somewhat declinate, from two to four feet high. *Leaves* alternate, bifarious, sessile on their sheaths, smooth on both sides; general length about twelve inches, and from four to five broad. *Sheaths* with a large, membranaceous, stipulary process at the mouth. *Spikes* several from the base of the stems, where they join the root, half immersed in the earth, sub-obovate, fastigiate, laxly imbricated with numerous straight, erect, linear-lanceolate, acute, involute, red, slightly villous, *exterior bractes*. *Inner bractes*, or inferior perianth, the length of the tube, but shorter than the exterior bractes, and irregularly tri-dentate. *Calyx* superior, sub-cylindric, membranaceous, pellucid, most slightly villous; *mouth* three-toothed. *Corol* with a long, slender, cylindric tube; segments of the exterior border linear-lanceolate, acute, red. *Lip* ovate-oblong, entire, speckled with red and yellow. *Filament* scarcely any. *Anther* of two long lobes, crowned with the long, characteristic, curved horn, which is incumbent on and reaches to the apex of the lip. *Nectarial filaments of König* oblong, and obtuse. *Germ* hairy, three-celled, with many ovula in each, attached to the axis. *Stigma* funnel-shaped,
I. and ciliate. *Capsule* .....
54 7. Z *squarrosum. R.*

Leaves lanceolar. *Spikes* squarrose, half immersed in the earth. *Bractes* linear, with long, taper, waved, recurved apices. *Lip* three-lobed, apex bifid.

A native of Burma, where it ripens its seeds in December. From Rangoon Mr. F. Carey sent the fresh roots, entire capsules, and ripe seeds to this garden, where the plants from both the seeds and roots grew freely, and the latter blossomed in August.

Root tuberous, as in ginger, &c. *Stems* herbaceous, considerably recurvate, from two to three feet high, entirely hid in the sheaths of the leaves. *Leaves* bifarious, sessile, lanceolar, smooth above, slightly villous underneath, cuspidate. *Sheaths* with two large conical processes rising from their mouths, one on each side. *Spikes* from the base of the stems, three-fourths hid in the earth, ovate, laxly imbricated, size of a goose-egg. *Bractes* green; the *exterior* solitary, one-flowered, linear, concave, long, taper, waved, recurved. *Inner*, one or two, (generally one), as long as the tube of the corol, with a three-toothed apex. *Flowers* pretty large, inodorous. *Calyx* superior, &c. as in the other species. *Corol* with a slender tube. *Exterior border* of three, pink-coloured, lanceolate, acute segments. *Inner*, or *lip* two-lobed at the base; apex bifid, colour a speckled mixture of purple, red, and yellow. *Filament* short, anther and beak together nearly as long as the lip *Germ* villous, three-celled,

with many ovula in each. *Style* and *stigma* as in the genus. *Capsule* short-pedicelled, ovate, conic, three-celled, three-valved, opening from the apex, inside of the valves bright scarlet while fresh. (Those sent from Rangoon by Mr. F. Carey, were, when they reached me, perfectly dry, and then measured three inches in length, and one in diameter.) *Seeds* many in each cell, arilled, arranged in two rows, and attached to the inner edge of the partitions. *Aril* complete, fleshy, white. *Perisperm* conform to the seed. *Vitellus* covers every part of the *embryo*, which is clavate, and nearly as long as the seed. Page Carey Ed. I. 55

8. Z. *panduratum. R.*

Leaves petioled above their sheaths, broad-lanceolar, smooth ; *ligula* large and scariose. *Spikes* radical, half immersed in the earth, lax. *Bractes* lanceolate. *Lip* panduriform, with oval, emarginate lamina.

This middling sized species is a native of the country about Rangoon. From thence Mr. F. Carey sent seeds to the Botanic garden in 1808, and in July, 1810, the plants raised from them blossomed abundantly.

Root ; numerous, long, fleshy, fibrous fibres, some of which swell into lanceolar tubers, as in *Curcuma ;* no *palmate tubers,* as in that genus. It possesses but little taste and no fragrance. *Stalks* erect, herbaceous, about three feet high. *Leaves* bifarious, petioled above their sheaths, broad-lanceolar, acute, smooth on both sides ; from six to twelve inches long, from three to four broad. *Sheaths* smooth above their respective leaves ; each ends in a very long, scariose, smooth ligula. *Spikes* radical, the lower half immersed in the soil, oblong, and rather loosely imbricated with lanceolate, coloured, concave, one-flowered, interior and exterior bractes. *Flowers* rather small ; *exterior border* of three, nearly equal, lanceolate, acuminate, pale red segments ; *inner* or *lip* very pale yellow, panduriform, that is with two, pretty large, rounded lobes at the base, and the *lamina* nearly oval, retuse, truncate, or emarginate. *Filament* broad, and short. *Anther* double, and crowned with the usual beak. *Germ* three-celled, with many ovula in each, attached to the inner angle of the cell. *Stigma* infundibuliform.

SECT. II. *Spikes terminal.*

9. Z. *capitatum. R.*

Herbaceous ; *leaves* linear-lanceolate, stem-clasping. *Spike* terminal, erect, strobiliform ; *bractes* lanceolate. I.

A native of the forests of Rohilcund, from thence Colonel Thomas Hardwicke sent plants to the Botanic garden, under the vernacular name *Junglee Adruk.* Here it flowers during the rains and the seeds ripen in September and October. 56

Root composed of many, long-peduncled, oval, smooth, pale-coloured, insipid, watery tubers, issuing from the base and sides of the bulb, and palmate tubers, which are of a pale yellow colour, and somewhat spicy taste. *Stems* erect, round, enveloped in the sheaths of the leaves, which are often a little hairy ; height of the whole plant when in blossom, from two to three feet. *Leaves* sub-bifarious, alternate, sessile on their sheaths, narrow-lanceolate, acute, smooth above, a little hairy underneath, about twelve inches long, and about two broad. *Spike* terminal, sessile on the mouth of the sheaths of the superior leaves, linear-oblong, somewhat strobiliform, many-flowered. *Flowers* sessile, large, pure yellow in very part. *Bractes* in pairs, one-flowered, permanent ; *exterior* lanceolate, concave, erect, longer than the tube of the corol. *Inner* ovate, shorter, immediately enveloping the germ, calyx, and nearly the whole of the tube of the corol. *Perianth* superior, one-leaved, about half the length of the tube of the corol, membranaceous, white, two or three-toothed. *Corol ; tube* cylindric, narrow. *Lip* with two, oblong, very distinct, expanding, lateral lobes ; *middle lobe* very large, and nearly round. *Anther* with a very long curved beak. *Stigma* (as in most plants of the order), funnel-shaped, with ciliate margins. *Nectarial* scales (of *König*), or hornlet conical. *Capsule* oval, three-sided, with the angles rounded, pretty smooth, size of a small olive, three-celled, three-valved ; each cell containing several, black, shining seeds, enveloped in a deeply jagged, white aril. *Perisperm* conform to the lower half of the seed which it occupies, pure white, cartilaginous. *Vitellus* above the perisperm, occupying nearly the upper half of the seed. *Embryo* vertical, passing through the centre of both perisperm and vitellus, sub-cylindric, both ends obtuse, &c. in every respect so exactly like Z. *Cassumunar,* that the same drawings and description may well serve for both. I. 57

10. Z. *marginatum. R.*

Leaves sessile, lanceolate ; *ligula* large and membranaceous. *Spikes* terminal. *Bractes* obovate, with transparent, membranaceous margin. *Nectary* three-lobed.

11. Z. *elatum. R.*

Leaves bifarious, linear, recurved. *Spikes* terminal, lanceolar, compactly imbricated with lanceolate, one-flowered bractes.

A native of the interior of Bengal ; in the Botanic garden it blossoms in July and August, and the seeds ripen in September and October.

Root tuberous, as in common ginger, but inwardly yellow ; from the tubers proceed the proper roots, many of which end in oblong, paler coloured tubers as in *Curcuma. Stems* herbaceous, straight, from four to five feet high, including the spike. *Leaves* bifarious, linear, recurved, smooth above ; with many adpressed, short, soft, white hairs underneath ; from twelve to eighteen inches long, and only one inch broad. *Sheaths* a little hairy ; *mouth* crowned with a very narrow, membranaceous process. *Spikes* terminal, solitary, of a narrow [illegible] shape, six inches long, and three in circumference, every part compactly imbricated with lanceolate, one-flowered bractes, which are an inch and a half long, and a little hairy on

Page Carey Ed. the outside. *Bractes ; interior, or inferior perianth* shorter and broader than the *exterior*, but like them stiff, and a little hairy. *Calyx* superior, white, smooth ; *mouth* unequally toothed, little more than half the length of the bractes. *Corol* exactly as in the other species, only considerably longer ; the colour a tolerable bright, lively yellow. *Stamina* with a short
I. filament, and very long curved beak crowning the linear two-lobed *anther*. *Nectarial* bodies
58 subulate. *Germ* oval, hairy, three-celled, with numerous ovula in each, attached to the axis. *Stigma* ciliate. *Capsule* oval, size of a small olive, three-celled, three-valved. *Seeds* numerous, lucid, black, enclosed in a large white ragged aril. *Embryo* simple, sub-lanceolate, base truncate, embraced by the perisperm : the upper half by the *vitellus*.

COSTUS. Schreb. gen. No. 4.

Corolla with the interior border of one, campanulate, back-cleft lobe. *Filament* lanceolate, with the *double anther* attached far below its apex. *Capsule* three-valved, three-celled. *Seeds* numerous, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

1. C. *speciosus. Smith in Trans. of Linn. Soc.* 1. 240. *Linn. sp. pl. ed. Willd.* 1. 11.

Leaves sub-sessile, spirally arranged, oblong, cuspidate, villous underneath.

Tjana-Kua. *Rheed. Mal.* 11. *p.* 15. *f.* 8.

Tsiana *speciosa. Gmel.* 9.

Herba spiralis hirsuta. *Rumph. Amb.* 6. *p.* 143. *t.* 64. *f.* 1.

Sans. Kemooka.

Hind. and *Beng.* Keoo.

Banksia *speciosa of Dr. König*, See *Retz. Obs.* 4. 75.

This is one of the most elegant looking plants of the natural order *Scitaminea*. It is a native of moist shady places, such as the low banks of water courses, &c. Flowers during the wet season.

Obs. König's description agrees so well with my plant, that I have scarcely any thing to add : the chief differences are,

1*st.* Mine is generally from three to four feet high, ascending spirally, with the leaves spirally disposed up and round the stem.

2*nd.* In this the spike is at all times erect, and rigid ; from about three to six inches
I. long.
59 3*rd.* There is nothing like a crown to the *anthers* ; and,

4*th.* The stigma consists of two, broad, glutinous lips, which gape wide while the pollen is shedding ; between them is evidently seen with the naked eye, the mouth of the perforated style ; on the back of the upper lip are seen the two white glands mentioned by König. I impute his not taking notice of the two large lips of the stigma, to his having examined the flowers sometime after they were gathered, when they coalesce.

The fresh roots are almost insipid. The natives make a preserve of them, which they deem wholesome, and nutritious ; the dry root does not at all resemble the *Costus arabicus* of the shops.

ALPINIA. Schreb. gen. No. 5.

Corolla with the interior border unilabiate. *Anther* double, naked. *Capsule* berried, three-celled. *Seeds* few, or many, arilled. *Embryo* simple, and furnished with both perisperm and vitellus.

SECT. I. *Inflorescence terminal.*

1. A. *Galanga. Linn. sp. pl. ed. Willd.* 1. 12. *Roscoe in Trans. of Linn. Soc.* 8. 345.

Perennial. *Leaves* sessile, broad-lanceolar. *Panicle* terminal. *Lip* oblong, unguiculate ; *apex* bifid. *Capsule* obovate, smooth ; *seeds* few.

Galanga *major. Rumph. Amb.* 5. *t.* 63.

Sans. Koolunyoga, Dhumoola, Teekshna-moola, Koolun-jana, Soogundha, Mahabhuravucha.

Hind. Koolinjan.

Arab. Kholinjan, or Khoolunjan.

Dr. Charles Campbell, at Bencoolen, sent the roots of these species from thence to the
I. Botanic garden near Calcutta, where the plants thrive remarkably well, and are in blossom
60 during the latter half of the hot season, April and May. Seeds ripen, though rarely, in November.

Root perennial, tuberous as in ginger, &c. possessing a faint aromatic smell, and strong pungent taste, like a mixture of pepper and ginger, accompanied with some degree of bitterness, and now ascertained to be the real *Galanga major* of the shops. *Stems* perennial, or at least more durable than those of herbaceous plants, nearly erect, round, smooth ; general length, when in flower, about six or seven feet ; and as thick as a slender walking cane. *Leaves* occupy from the middle of the plant upward ; the lower half being inverted in leafless sheaths only ; they are short-petioled, bifarious, lanceolar, margins white and somewhat callous, both surfaces smooth ; from twelve to twenty-four inches long, and from four to six broad. *Sheaths* smooth, with a short, rounded, ciliate, stipulary process above the insertion of the leaf. *Panicle* terminal, erect, oblong, crowned with numerous, spreading, simple dichotomous branches, each supporting from two to five, or six, pale greenish white, some-

what fragrant flowers. *Involucre* of König, in our plants generally two-leaved, lanceolate, first withering, then falling before, or while in blossom. *Bractes* concave, solitary at the divisions, and sub-divisions of the panicle. *Calyx* superior, sub-cylindric, smooth, white, scarcely the length of the tube of the corol ; *mouth* one-toothed. *Corol ; exterior border* of three, nearly equal, linear, recurved, smooth, pale greenish divisions. *Inner border* or *lip* unguiculate, somewhat ascending, so as nearly to meet the slightly declining anther ; oval or ovate oblong, concave, apex divided into two lobes by a pretty deep, straight fissure ; margins incurved, curled, minutely laciniate, white, with here and there a small reddish speck, and two recurved fleshy, coloured hornlets at the base of the claw. *Filament* rather longer than the claw of the lip. *Anther* double, apex deeply emarginate, projecting horizontally over the middle of the lip. *Germ* beneath, smooth, oval, three-sided, three-celled, with only two ovula in each cell, attached to the middle of the partition. *Style* filiform. *Stigma* funnel-shaped, fringed ; while the flower is in vigorous blossom, erect between the lobes of the anther, afterwards recurved under the anther. *Nectarial* bodies (of König) nearly square, fluted. *Germ* oblong, smooth, three-celled, with two ovula in each, attached to the axis. *Capsule* the size of a small cherry, obovate, smooth, deep orange red, three-celled, but entire, as no separation seems to exist, the thin dry cortex crumbles, or breaks to pieces, without any tendency to separate into valves. *Seed* one, rarely two in each cell, much compressed, size of a grain of black pepper. *Aril* nearly complete, there being only an opening at the apex, thin, rather fibrous, and of a dull white colour. *Integuments* two, or three ; *exterior*, tough, fibrous, polished, of a dark chesnut colour, a little wrinkled ; *inner* hard, dark brown ; between the two is a spongy lamina of the same colour, and I cannot well say to which it most properly belongs. *Perisperm* white, friable, and very hard. *Embryo* simple, dull white, (canus,) roundish in the body of the perisperm, and with the narrow, conic *radicle*, passing through it and pointing to the umbilicus.

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Note by Mr. Colebrooke. " The root of this plant being ascertained to be the *Galanga major* of the druggists, conformably with what has been said of it by *Rumphius*, there is no doubt of its being *Kholinjan* of the Arabs, termed in Hindee *Kulinjan*. In Sanskrit it is called *Kulanjana*, according to one authority. (the *Rajnighantu ;*) but *Sugandha*-vacha, sweet-scented Acorus ; as also *Mahabhari-vacha*, according to another Indian treatise, (the *Bhava-pracasa*) If the first name be genuine Sanskrit, which is however doubtful, the similar names in other languages, including the European, must be derived directly, or immediately from it."

2. A. *Allughas. Roscoe in Trans. Linn. Soc.* 8. 346. I. 62

Leaves lanceolar, polished. *Panicle* terminal. *Lip* bifid ; *lobes* retuse. *Capsules* spherical, (black,) one-valved, many-seeded.

Hellenia *Allughas. Linn. sp. pl. ed. Willd.* 1. 4.

Mala-inschi-kua. *Rheed. Mal.* 11. *p.* 29. *t.* 14.

Sans. Taruka.

Beng. Taruka, or Tara.

This plant is common near Calcutta, in low moist places, among brush wood. Flowering time the beginning of the rainy season.

Root tuberous, biennial, or perennial, horizontal, brownish, with many pretty thick fibres, considerably aromatic. *Stem* erect, slightly compressed, entirely covered with the sheaths of the leaves ; from three to six feet high. *Leaves* alternate, bifarious, petioled, oblong, ending in a fine twisted point ; both sides smooth, and glossy ; the under side paler colour ; *veins* numerous, straight, exceedingly fine, going off at an acute angle ; generally about a foot long, and four inches broad. *Petioles* sheathing with a stipulary rounded process rising above the insertion of the leaf. *Panicle* terminal, bending slightly to one side. *Flowers* numerous, in succession, large, of a beautiful rose colour, inodorous. *Calyx* superior, gibbous, fleshy, generally two or three-toothed. *Corol* one-petalled ; *tube* short ; *border* double ; the *exterior* three-parted ; *divisions* nearly equal, outwardly downy, concave, particularly near the ends, pale greenish rose colour ; the superior one more remote. *Interior* border, or *lip* two-cleft, with two fleshy protuberances near the base ; *divisions* with two-toothed apices and waved margins, colour a beautiful mixture of deep, and pale rose. *Nectary* (of *König* and *Retz*) two oblong, compressed, fleshy bodies, embracing the base of the style. *Filament* short, broad, much flattened. *Anther* double, each lobe ending in an obtuse hornlet. *Germ* inferior, globular. *Style* lodged in the groove of the filament. *Stigma* clubbed, somewhat three-sided, obtuse, with a crescent-like fissure, and ciliate margin. *Capsule* globular, inclining to be three-sided, smooth, when ripe black, and friable, not opening by sutures, but crumbling to pieces, crowned with the permanent, withered calyx, and corol, three-celled.

I. 63

3. A. *bracteata. R.*

Leaves lanceolar, villous underneath. *Raceme* terminal, simple ; *pedicels* one-flowered. *Bractes* green.

A native of the eastern parts of Bengal. In the Botanic garden near Calcutta it flowers in March. This is one of the smallest of our East India *Alpinias ;* this circumstance, and the green bractes, immediately distinguish it from *malaccensis*, which is not so easily done in a specific definition.

Root biennial, or perhaps, perennial. *Stems* erect, about three feet high, entirely invested in the smooth sheaths of the leaves. *Leaves* bifarious, petioled, from ovate-oblong below, to lanceolar above, fine-pointed ; the upper surface smooth, polished, deep green, villous and paler underneath ; length from six to eighteen inches. *Petioles* proper, about an inch long, and deeply channelled. *Sheaths* smooth, rising a little above the insertion of the

Page Carey Ed. proper petioles on the inside. *Raceme* terminal, erect, simple, about a span long, slightly villous; before expansion, embraced by one or two caducous sheaths. *Pedicels* throughout one-flowered, round, short, and villous. *Bractes* (or inferior perianth) solitary, one-flowered, more permanent than in the other species, and of a dull green colour, hiding the calyx. *Calyx* shorter than the bracte, open on the underside, bidentate. *Corol; exterior border* of three oval, nearly equal, white segments; *lip* somewhat three-lobed; lateral lobes large and incurved into a tube round the stamina; exterior narrower, with a bifid apex, colour a beautiful mixture of crimson and yellow, with a paler belt on each side. *Filament* short, with two curved spurs at its base. *Anther* double, linear. *Germ* oval, three-celled; with many ovula
I. in each, attached to the inner angle. *Stigma* funnel-shaped, sub-ciliate.
64 4. A. *malaccensis. Roscoe in Trans. Linn. Soc.* 8. 345.

Leaves lanceolate, petioled, villous underneath. *Raceme* terminal, simple. *Lip* obscurely three-lobed, with two spurs at the base; lateral lobes incurved. *Capsules* obliquely spheroidal.

Maranta *malaccensis. Linn. sp. pl. ed. Willd.* 1. 14.

Galanga *malaccensis. Rumph. Amb.* 5. *p.* 176. *t.* 71. *f.* 1.

A most beautiful and stately plant, a native of Chittagong, and from thence sent by Mr. W. M. Maddern, to the Botanic garden near Calcutta, where it blossoms in April and May, the very hottest time of the year; and ripens its seed in the rains.

Root perennial. *Stems* numerous, (within four years, a single root increased so much, as to produce about fifty,) from six to ten feet in height; those in the centre erect, in the circumference bending out; in two, three, or four years, the stoutest blossom, ripen their seed, and decay. *Leaves* bifarious, petioled, lanceolate, acute; margins often waved, and slightly fringed with short brown hairs; upper surface smooth; under downy; length from two to three feet, and from three to eight or nine inches broad. *Sheaths* smooth, embracing the stems completely; *ligula* ovate, obtuse, entire, villous. *Petioles* (I mean the space between the ligula and leaf), about three inches long and channelled. *Racemes* terminal, solitary, erect, always simple; from six to twelve inches long. *Peduncle* round, and villous. *Pedicels* short, villous, one-flowered, the largest sometimes droop a little from the weight of the flowers. *Involucre* of two, or three, caducous, boat-shaped leaves embracing the raceme. *Flowers* very large, a pure smooth shining white, except the inner border, or labium; which is a beautiful mixture of orange and crimson. *Bractes*, (or inferior calyx), gibbous, bursting on one side to the base, and partially on the other. *Calyx* superior, one-leafed, gibbous,
I. length of the bracte, splitting into various portions. *Corol; exterior border* of three, ob-
65 long, obtuse, entire segments, of which the upper is largest. *Inner border* or *labium*, very large; when expanded, three inches broad, and two and three quarters long, somewhat three-lobed, the two lateral semi-circular and incurved into a tube; the middle one smaller, more projected, curled, and sometimes bifid; from the base on each side an incurved, sharp spur. *Filament* about as long as the large, broad, deeply bifid, obtuse, two-lobed anther. *Nectary* of König; in most of the other plants of this order, I have found this part to consist of two distinct bodies, here it is of one, very thick and short, with its truncated apex tuberculate. *Germ* inferior, obovate, hairy, three-celled, with many ovula in each, attached to central receptacles. *Style* toward the apex, hairy. *Stigma* rising erect through the bifid apex of the anther, funnel-shaped, hairy. *Capsule* obovate, spheroidal, size of a very large gooseberry, armed with short, sharp, stiff, slender bristles; when ripe nearly dry, and yellow, three-celled, three-valved. *Seeds* numerous, ovate, oval, or obovate, immersed in a large portion of a soft pulpy matter, which in the immature state form distinct arils; on each side, and round the apex a groove. *Integuments* two, brown, and rather thin. *Perisperm* cartilaginous, cloven at both ends by a brown spongy fissure, but deepest from the apex. *Vitellus*, the centre of each of the superior limbs of the perisperm, is occupied by a small, thin, oblong body of a clearer colour; and widely distinct from both embryo and perisperm. *Embryo*, the upper part crescent-shaped, with its horns projecting into the limb of the perisperm, and in some degree into the vitellus. *Radicle* inferior, projecting straight from the convex, or under side of the crescent, with its base to the umbilicus.

Obs. This is the most beautiful plant of the whole genus, even surpassing A. *nutans*, which I believe the Botanical Repository considers a species of *Renealmia*.

5. A. *nutans. Roscoe in Trans. of Linn. Soc.* 8. 346.

I. *Leaves* lanceolar, short-petioled, smooth. *Racemes* compound, by the lower pedicels being
66 two or three-flowered, drooping. *Lip* broad, three-lobed, the lateral incurved into a tube; the exterior curled and bifid. *Capsules* spherical, opening on the sides. *Seeds* few.

Beng. Poonnag-champa.

Renealmia *nutans. Andr. Bot. Repos.* 5. *t.* 360.

Globba *nutans. Linn. sp. pl. ed. Willd.* 1. 15. 3.

This very elegant plant, a native of the Eastern Islands, was introduced by the Revd. Dr. Carey, into the Botanic garden near Calcutta, where it blossoms in April and May.

Root perennial, tuberous, &c. as in the other species. *Stems* more or less bent to one side, (a direction common to most of the plants of this order,) from four to six feet high. *Leaves* bifarious, sub-sessile on their sheaths, occupying the upper half of the stems; the lower are broad-lanceolar, the upper much narrower, all are entire, and remarkably smooth on both sides; while young the margins villous; length from one to three feet. *Sheaths* of the leaves smooth, with a stipulary bearded process, rising above the insertion of the leaf. *Racemes* terminal, compound, variously curved, villous, about a foot long, drooping under the leaves. *Involucre* of generally two, caducous, lanceolate, boat-shaped sheaths. *Flowers* nu-

merous, large. *Pedicels* two or three-flowered. *Bractes* large, concave, pure white, with a pink-coloured apex, smooth; a common one to the two or three flowers, and a proper, smaller one to the second and third flowers, which expand in succession for a long time after the first. *Calyx* superior, colour of the bractes, three-toothed. *Corol* with a double border; *exterior* three-parted, pale pink, with deeper rosy apices; upper division oval, incumbent; lower two linear-oblong, revolute, with the apices rounded. *Inner* lip large, ovate-cordate, obscurely three-lobed, lateral lobes incurved into a large campanulate tube; apex of the interior lobe bifid, margins curled; at the base are two spurs which embrace the base of the style, colour of the whole a mixture of deep orange yellow, with a dark crimson ground, and veins. *Germ* beneath, oval, hairy, three-celled, with many ovula in each, attached to the inner edge of the partitions. *Stigma* on the first expansion of the flower erect through the fissure of the apex of the anther; afterwards, as the style lengthens, its apex becomes involute, and throws the stigma under the anther. *Nectaries* (of König) two, square, fluted, fleshy bodies within the tube, on the apex of the germ, embracing the base of the style. Page Carey Ed. I. 67

Obs. This is no doubt one of the most gaudy of our East Indian *Scitamineæ*. It multiplies itself by the root very fast, grows quickly, and continues to produce its numerous, large, elegant, drooping panicles, of beautiful flowers for two months, and more or less the whole year round.

6. A. *mutica. R.*

Leaves short-petioled, narrow-lanceolar, polished. *Racemes* erect, compound. *Lip* three-lobed, base spurless. *Capsule* buried. *Seeds* numerous, angular. *Aril* evanescent.

Found indigenous in the forests of Prince of Wales' Island by Mr. W. Roxburgh, and from thence introduced into the Botanic garden near Calcutta, where it flowers about the beginning of the rains, and ripens its seed from October till January.

Stems numerous, erect, involved in the sheaths of the leaves, from four to six feet high, generally biennial, as they do not perish till after the seed is ripe. *Leaves* alternate, bifarious, short-petioled, narrow-lanceolar, acute polished, and entire, from ten to twenty-four inches long. *Sheaths* smooth, ending in a rounded ligula, above the insertion of the leaf. *Racemes* terminal, erect, compound, conical, many-flowered; *peduncles* a little downy. *Pedicels* alternate, short, villous, two, three, or even four-flowered. *Bractes* of the pedicels, and pedicelli solitary, oblong, caducous. *Flowers* numerous, large, drooping. *Calyx* longer than the tube of the corol, widening from the base; mouth irregularly three-toothed, with the lower fissure deepest, pure white. *Corol; tube* much recurved, much shorter than the calyx; *border* double. *Exterior* three-parted; *superior divisions* incumbent, oval, concave, *inferior* two smaller, linear-oblong, narrower than the *superior* one; all are obtuse and of a pure glossy white colour. *Lip* or *inner border*, large, elegantly variegated with crimson and yellow, surrounded with an orange-coloured edging, three-lobed; the two lateral lobes semi-lunar, and incurved into a large sub-campanulate tube under the upper segment of the *exterior* border; exterior lobe smaller, curled, and bifid. In this species there are no spurs between its base and the filament, as in most of the other species of this genus. *Filament* nearly as long as the broad double anther, which projects over the middle of the lip. *Germ* round, villous, three-celled, with many ovula in each attached to the partitions near the axis. *Style* filiform, embraced at the base by a single, truncate, dentate, glandular body, (nectary of König, Retzius, and Willdenow.) *Stigma* funnel-shaped, ciliate, rising with a curve through the bifid apex of the anther. *Capsule* berried, size of a large gooseberry, deep orange, or yellow, according to their state of maturity; not opening spontaneously as in A. *nutans*, when dry, wrinkled, and a little hairy. *Seeds* numerous, angular, arilled. *Aril* complete, but thin, and when perfectly dry scarcely traceable. *Integuments* two; exterior thin, inner dark brown, and spongy. *Perisperm* cartilaginous, a deep pit at the base, and a deep cleft from the apex down to near the middle. *Vitellus* as in *Alpinia malaccensis*, in the centre of each of the superior lobes of the perisperm, is a somewhat clearer, distinct body, as if a continuation of the horns of the crescent of the embryo, but perfectly distinct, and readily separable from them and the perisperm. *Embryo* an inverted crescent, with the cylindric radicle descending from the convex side through the pit at the base of the perisperm to the umbilicus. I. 68

Obs. This is also a very elegant species, and holds a middle rank between *nutans* and *calcarata*.

7. A. *calcarata. Roscoe in Trans. of Linn. Soc.* 8. 347. I. 69

Leaves linear-lanceolar, polished. *Spike* compound, erect. *Lip* ovate-oblong, apex curled and bifid.

Renealmia *calcarata. Andr. Bot. Repos.* 6. *t.* 421.

A native of China, and from thence introduced by Captain J. Garnault, into the Botanic garden near Calcutta in 1799; where it thrives luxuriantly in the common soil of the garden, and blossoms in March, April, and May, but more or less all the year.

Root perennial, horizontal, somewhat woolly, crooked, pale-coloured, stoloniferous, fragrant, enveloped while young in short, alternate sheaths; when old marked with their cicatrices; and furnished with many fleshy ramous fibres. *Stems* oblique, smooth, from two to four feet high. *Leaves* alternate, bifarious, short-petioled on their sheaths, narrow-lanceolar, fine pointed, entire, smooth on both sides; length frequently twelve inches, and the breadth from one to two. *Sheaths* of the leaves stem-clasping, smooth, with a stipulary process projecting above the insertion of the leaf. *Racemes* terminal, solitary, erect, compound. *Flowers* numerous, large, generally in pairs or more, but expanding at different periods. *Bractes* solitary, heart-shaped, white, one-flowered. *Perianth* superior, three-toothed, white, smooth. *Corol* with double border. *Exterior* three-cleft; *divisions* equal, linear, expanding, pellucid,

Page Carey Ed. white. *Interior*, or *lip* ovate-oblong, large, deeply coloured with dark purple veins on a yellow ground, apex two-lobed, lobes rounded and curled; there are no lateral lobes in this species, nor are the sides much incurved; but two, incurved, sharp, subulate horns project from its two posterior angles, and embrace the base of the filament. *Filament* single, opposite to the lip of the corol, projecting, &c. as in the genus. *Germ* spherical, hairy, three-celled, with many ovula in each, attached to the inner angle of the cells. *Stigma* funnel-
I. shaped, ciliate. *Nectarial* scales nearly four-sided, with apices crenulate.
70 8. A. *spicata. R.*

Spike terminal, oblong, compactly imbricated with narrow lanceolate, acute bractes.

A native of Sumatra, from thence introduced by Mr. Roxburgh into the Calcutta Botanic garden in 1803. Is the slowest growing and smallest of the genus in this garden. Flowering time the close of the rains.

Root as in the other species. *Stems* arising in an oblique direction to the height of about two feet, when from two to three years old the flowers appear, and after their functions are performed, the stems decay. *Leaves* bifarious, sessile on their sheaths, broad-lanceolar, fine-pointed, surfaces and margins smooth, from six to twelve inches long. *Sheaths* of the leaves smooth, ending in a long, bifid, or simple ligula. *Spikes* terminal, strobiliform, compact. *Bractes*, the *exterior* imbricate, ensiform-lanceolate, one-flowered, outside slightly villous. *Interior* or *inferior calyx*, one-leaved, sub-cylindric, length of the perianth proper, mouth obliquely truncate, outside villous. *Calyx* superior, like the inner bracte, and of the same length, &c. *Corol, exterior border* of three, very acute, linear-lanceolate segments. *Inner* or *lip* uncertain, as the only two spikes I have yet seen did not expand sufficiently, to allow me to ascertain its form. *Filament* short, anther large, of two, long linear lobes with the style sunk between them. *Germ* oval, very hairy, three-celled, with numerous ovula in each, attached to the axis. *Style* slender. *Stigma* large, consisting of two, gaping, unequal lobes.

SECT. II. *Inflorescence radical.*

9. A. *cardamomum. R.*

Scapes from the base of the stem, compoundly flexuose, procumbent. *Lip* three-lobed, with calcarate base.

I. Amomum *repens, seu Cardamomum. Wood, v.* 2. *p* 365. *t.* 131.
71 Amomum *repens. Roscoe, Willd. and Sonnerat.*
Elettaria. *Rheed. Mal.* 11. *p.* 9. *t.* 4. *and* 5.
Cardamomum minus, Pharm. Lond. and Edinburgh.
Sans. Prithweeka, Chundruvala, Ela, Nishkooti, Buhoola.
Beng. Elachi, Elaich.
Ailum chedy of the Malabars, of the Malabar Coast.
Hil of the Persians.
Kakulah, also Hal, of the Arabs.
Teling. Sana-yallacci.
Cardomum. *Buch. Journey,* 2. 336—510, 538, *and* 3. 225.
A native of the mountainous part of the Coast of Malabar.

Root tuberous, with numerous fleshy fibres. *Stems* perennial, erect, smooth, joined, enveloped in the spongy sheaths of the leaves; from six to nine feet high. *Leaves* bifarious, sub-sessile on their sheaths, lanceolate, fine-pointed, somewhat villous above, and sericeous underneath, entire; length from one to two feet. *Sheaths* slightly villous, with a rounded stipulary process rising above the mouth. *Scapes* several (three or four) from the base of the stems, resting on the ground, flexuose, jointed, ramous, from one to two feet long. *Branches* or *racemes* alternate, one from each joint of the scape, sub-erect, two or three inches long. *Bractes* solitary, oblong, smooth, membranaceous, nerved, sheathing, one to each joint of the scape, which embrace the insertion of the raceme, or branch; and one at each of their joints. *Flowers* alternate; short-pedicelled, solitary at each joint of the racemes, opening in succession for a length of time, as the racemes lengthen. *Calyx* above, widening to the three-toothed mouth, about three quarters of an inch long, striated with fine nerves, permanent. *Corol* withering. *Tubes* slender, as long as the calyx. *Border* double, exterior of three, oblong, concave, nearly equal, pale greenish white divisions. *Inner lip* or *nectary* obovate, much longer than the divisions of the exterior border; margins somewhat curled, with the
I. apex slightly three-lobed, marked chiefly in the centre, with purple violet stripes: at each
72 side of its insertion and close by the base of the filament is a small acute hornlet, as in most of the plants of this genus, and in several of the other genera of our other Indian *Scitamineæ*. *Filament* short, erect. *Anther* double, emarginate. *Germ* beneath, oval, smooth. *Style* slender. *Stigma* funnel-shaped. *Nectarial* scales of König, subulate, almost half the length of the tube of the corol. *Capsule* oval, somewhat three-sided, size of a small nutmeg; three-celled, three-valved. *Seeds* many, angular.

Obs. The following account of this interesting plant has lately been transmitted to me by Captain Dickson, the Commanding Officer of the district of Wynaad where the *Cardomum* is cultivated, viz.

"The *Cardomum* shrub is found in great abundance among the western mountains of Wynaad, and is called by the natives of Malabar *Ailum chedy* (the *Ailum shrub*). I cannot obtain any satisfactory derivation of the true import of the word *Ailum*, unless, as is alleged, it implies in the Sanskrit language, celebrity, and eminence.

"The shrub is said to be produced as follows. Before the commencement of the perio-

dical rains, in June, the cultivators of the *Cardomum* ascend the coldest, and most shady sides of a woody mountain; a tree of uncommon size and weight is then sought after, the adjacent spot is cleared of weeds, and the tree felled close at its root. The earth shaken, and loosened by the force of the fallen tree, shoots forth young *Cardomum* plants in about a month's time. I have repeatedly enquired of the natives the means by which the *Cardomum* plants are first produced, and have invariably been told as already stated. They attribute no other effects to the falling tree, which may be selected from any species, than such as are derived from its weight and strength, added to the shade and shelter which its branches afford to the young plants. I have heard it by some asserted that the *Cardomum*, like the famed Phœnix, would emerge from the ashes of any large forest tree, but these stories were uttered only by the ignorant, and are too absurd to require comment.

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"The shrub continues to grow in this manner until after the early rains of the fourth year, in February, when it has reached its utmost height, which varies from six to nine feet; four or five tendrils are now seen to spring from its stem near the root, and afterwards the fruit is produced, which is gathered the following November; and requires no other preparation, than drying in the sun. The fruit is annually collected in this way, until the seventh year, when it is usual to cut it down, and from the trunk other sprouts arise, in course of the next monsoon; which grow, flourish, and are cultivated as before. The husk with the seed I have called the fruit, as it corresponds with the native name. The seeds are termed the rice, and the tendrils the threads of the plant.

"I do not hear of any varieties in the species, and now enclose you a specimen of some just given to me by the person who farms the collection, and accounted of an inferior growth. It may not be unnecessary to mention, that this commodity yields to Government from 25 to 30,000 rupees per annum. The inhabitants use it as a general condiment to their food, and it is likewise held in sacred estimation for the purposes of sacrifice. It is constantly chewed with betel, and some medicinal properties are ascribed to it when used in decoction for complaints of the bowels. I am assured, by all, that the seeds of the *Cardomum* will never produce plants, and that it is only to be propagated as already stated, or by cuttings."

10. A. *punicea. R.*

Leaves lanceolate. *Spikes* radical, compact, imbricated. *Lip* entire, sub-parabolic; *base* spurless.

A stately species, a native of Sumatra, from thence sent by the late Dr. C. Campbell, to the Botanic garden near Calcutta, where it blossoms in March and April.

Roots hard and bifarious. *Suckers* numerous, running far under the surface of the earth. *Stems* numerous, erect, or oblique, smooth, swelled near the base; general height about six or seven feet, and as thick as a slender walking cane. *Leaves* sub-bifarious, short-petioled on their sheaths, lanceolate, rounded at the base, both sides smooth; from six to twenty inches long, by from three to six broad. *Sheaths* smooth on both sides, rising into a short, ciliate ligula, above the insertion of the short, semi-cylindric, proper petioles. *Spikes* radical, half immersed in the earth, sub-cylindric, pretty compactly imbricated with from oblong to lanceolate, coloured, smooth, one-flowered bractes. *Flowers* large, colour a bright red, like the finest carmine. *Bractes interior*, or *inferior perianth*, tubular, length of the tube of the corol; with an unequally two, or three-toothed mouth. *Perianth proper* superior, tubular, length of the tube of the corol; *mouth* generally bifid. *Corol* with long, slender *tube* hid within the bractes, and perianths. *Exterior border* of three, small, paler coloured, lanceolate segments. *Lip* highly coloured, large, entire, horizontal, sub-parabolic, the lower part broad, and incurved round the stamina; *lamina* linear, with entirely rounded, or slightly marginate apex. *Filament* short, base spurless. *Anther* double, apex bifid, and naked. *Germ* three-celled, with numerous ovula in each, attached to their respective receptacles, a little removed from the axis. *Base* of the style embraced by two subulate nectaries. *Stigma* a lamellate, ciliated gape.

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11. A. *Cardamomum medium. R.*

Leaves lanceolar, villous underneath. *Spikes* radical, lax. *Lip* ovate-lanceolate. *Capsules* pedicelled, of an ovate oblong, conical shape, and nine-winged.

A native of the hilly countries in the vicinity of Silhet, where the plant is called Do-Keswa. It blossoms about the beginning of the rains, in June, and the fruits ripen in September, when they are gathered, and sold to the dealers in drugs.

Leaves petioled above their sheaths, linear-lanceolar, downy underneath, from two to three feet long, by two to four inches broad. *Sheaths* villous, rising in an obtuse ligula above the insertion of the leaf. *Spikes* radical, oblong, laxly imbricated, rising but little above the earth; lower part, or scape hid in the soil, and clothed with shorter scariose bractes. *Flowers* numerous, large, red, fragrant. *Bractes; exterior*, one under each flower, lanceolate, ribbed, smooth, yellowish pink; *interior*, or *inferior perianth* tubular, length of the proper perianth. *Calyx* superior, length of the tube of the corol, tubular, with three-toothed, coloured apex. *Corol; tube* cylindric, long and slender; *segments* of the border linear-oblong, obtuse. *Lip* with pretty broad cordate base, from thence tapering to its entire obtuse point, much longer than the segment of the exterior border; margins curled. *Filament, anther, germ, style, stigma, and nectarial bodies*, as in the genus. *Capsules* pretty long-pedicelled, ovate-oblong, while fresh about an inch and a half long, and nearly one in diameter, somewhat three-lobed, each angle marked with a larger vertical wing, and two smaller on the flatter sides, between the large ones three-celled. *Seeds* numerous, obovate, with a groove on one side. *Integuments* two; *exterior* soft, while fresh it may be called the succulent aril; *interior* white and rugose. *Perisperm* conform to the seed, white, and friable, perforated by a spongy, brown substance

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Page Carey Ed. above the embryo. *Vitellus* somewhat hyaline, rising on each side of the perforation like two horns. *Embryo* sub-clavate, its small end lodged at the umbilicus.

Obs. The form of the capsule, which resembles that of Gærtner's *Zinziber Ensal*, and the acrid, aromatic taste of the seeds, induce to conclude that this is the plant which produces the *Cardamomum medium* of the writers on Materia Medica.

12. A. *linguiforme. R.*

Spikes radical, linear, rather open. *Lip* linguiform, bifid; *base* broad, and spurless; *sides* incurved.

I. 76 A native of the interior parts of Bengal, where it blossoms during the rains.

Root perennial, throwing off numerous suckers, which run both above and under the surface of the earth, by which this species is soon multiplied. *Stems* many, erect, or nearly so, as thick as a man's forefinger, smooth, from four to six feet high. *Leaves* bifarious, sessile on their sheaths, lanceolate, smooth on both sides; from twelve to twenty inches long, by from four to five broad. *Sheaths* smooth, rising little above the insertion of the leaf. *Spikes* radical, solitary, the apex only rising above the soil, laxly imbricated with oblong, obtuse, smooth, exterior, and interior, one-flowered, green *bractes*; besides the interior, proper, tubular, thin, colourless *bractes* or *inferior calyx*. *Calyx* superior, tubular, length of the tube of the corol; *mouth* three-toothed, split quite down on one side; colour from the middle upwards deep red. *Corol; exterior border* of three, sub-lanceolate, obtuse, red segments. *Lip* sub-linguiform, the base broad, and axis incurved, forming an envelope for the stamen, from thence projecting almost horizontally, into a long linear, bifid lamina, with curled margins; colour yellow, with a little red down the centre. *Stamen* as in the genus. *Germ* hairy, three-celled; *ovulæ* many, attached to one fleshy receptacle *in the inner angle*. *Style* embraced at the base by the nectarial bodies, which are in this species bidentate. *Stigma* large, and red.

GLOBBA. Schreb. gen. plant. N. 54.

Corolla with the interior border two-lobed, or none. *Filament* very long, base tubular, and winged with a cruciform lip. *Anther* double, with an appendix, or naked. *Capsule* one-celled, three-valved. *Seeds* many, attached to three parietal receptacles. *Embryo* simple, and furnished with both perisperm and vitellus.

I. 77 1. G. *marantina. Willd. spec. plant.* 1. 153.

Leaves lanceolar. *Spike* terminal, sub-sessile, strobiliform, bulbiferous. *Anther* four-horned.

G. *marantina. Smith's Exot. Bot.* 2. *p.* 85. *t.* 103. *Roscoe in Trans. of Linn. Soc.* 8. 356. Lompujum silvestre minus. *Rumph. Amb.* 5. 150. *t.* 64. *f.* 2.

A native of the Moluccas, and from thence introduced into the Botanic garden near Calcutta by bits of the root found amongst the earth in which nutmeg and other plants were brought from Amboyna. Flowering time, in Bengal, the rainy season.

Root perennial, consisting of many, small, oblong, fleshy tubers, united to the base of the stems. *Stems* annual, about twelve or eighteen inches high, somewhat recurved, enveloped in the sheaths of the leaves, the whole as thick as a rattan and a little compressed. *Leaves* bifarious, sessile on their half stem-clasping sheaths, broad-lanceolate, acute, smooth above, somewhat villous and whitish underneath, margins waved; length from one to six inches, the lower being very small, and cordate. *Sheaths* half stem-clasping, smooth, with semi-lunate, projecting, bearded mouths, rising above insertion of the leaves. *Spikes* terminal, sessile, solitary, strobiliform, oblong. *Bractes* numerous, ovate-cordate, the lower half, or more, and sometimes even the whole, have each a single, small, brownish, sessile, pointed, ovate bulb in the axill; the superior are smaller and generally embrace a single flower each. *Flowers* slender, bright-yellow, and fragrant. *Calyx* superior, somewhat gibbous, three-toothed. *Corol* one-petalled. *Tube* long, and very slender. *Border* double; *exterior* three-parted, nearly equal, oblong, concave, and reflexed; *inner* of two lobes, which are longer by one-third than those of the exterior border, cuneate, and of a deeper yellow, reflected over the anterior two divisions of the outer border. *Lip* elevated on a continuation of the tube, a little above the former, consisting of two cuneate, reflected segments, united at the middle only. The upper end continued into a very long, slender, incurved, grooved filament. *Anther* double, with two horns from each side. *Germ* beneath, round, turbercled, one-celled, ovula parietal. *Style* slender, as long as the tube of the corol and filament, and lodged in a groove therein. *Stigma* funnel-shaped. *Pericarp;* I have not found it come to maturity. The little bulbs found in the axills of the lower bractes of the spike, readily vegetate, and thus the plant is abundantly propagated.

I. 78

2. G. *bulbifera. R.*

Stems bulbiferous. *Leaves* oblong. *Racemes* terminal, erect, shorter than the leaves, bulbiferous.

Teling. Conda pooshpoo.

A native of the northern Circars.

3. G. *orixensis. R.*

Leaves oblong. *Panicle* terminal. *Anther* naked. *Capsule* verrucose.

Is a native of the moist vallies in the northern Circars, and flowers during the rainy season.

Roots biennial. *Stems* annual, bending obliquely to one side, as in the case with most plants of the natural order, about two or three feet long; lower part involved in a few simple sheaths, above with the sheathing petioles of the leaves. *Leaves* alternate, bifarious, very

short-petioled, oblong, ending in a tapering filiform point, entire, smooth, finely veined ; from eight to ten inches long, and from two to four broad. *Petioles* short. *Sheaths* opening on the side opposite to the leaf. *Panicles* terminal, erect, oblong, thin, rigid. *Flowers* sessile, small, deep orange yellow. *Bractes* solitary, one-flowered, oval, falling. *Calyx* one-leaved, mouth three-toothed. *Corol ; tube* a little curved, widening gradually to the mouth, twice the length of the calyx. *Border* double ; *exterior* three-parted ; upper division largest, sub-erect, concave ; the other two inferior, and ovate. *Interior* of two, smaller, opposite, ovate lobes. *Filament* very long, much curved, base tubular, and ornamented with a large, orange-coloured, two-lobed lip, or apron. *Anther* at the extremity of the filament, naked, double, or two-lobed. *Style* embraced at the base by the two subulate bodies *(nectaries of König)* ; above the tube of the corol, it takes a curved direction like the filament, but is shorter, so that the curve is less ; its end passes between the lobes of the anther. *Stigma* clubbed, half immersed between the lobes of the anther. *Capsule* sub-globular, watery, fleshy, one-celled. *Seeds* many.

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4. G. *Hura. R.*

Leaves ovate-oblong. *Racemes* terminal, erect ; *pedicels* tern, three-flowered. *Anther* with a membranaceous crest.

Hura siamensium. *Kön. in. Retz. Obs.* 3. 49.

Native of the peninsula of Malacca.

5. G. *pendula. R.*

Leaves lanceolate. *Racemes* terminal, compound, much longer than the leaves, pendulous. *Anther* bicalcarate.

Found by Mr. William Roxburgh, on the Island of Pulo-Pinang. Flowering time the rainy season.

Root fibrous. *Leaves* lanceolate, smooth, fine-pointed. *Sheaths* a little hairy on the outside. *Racemes* terminal, solitary, compound, very long, pendulous. *Pedicels* remote, diverging, generally three-flowered. *Bractes* caducous ; those of the pedicels solitary, oblong, ciliate ; those of the flowers oval, ciliate. *Calyx* campanulate, three-toothed. *Corol ; tube* ascending, long and slender ; *border* double. *Exterior* three-parted, of these the upper one is concave ; the other two obliquely obovate, expanding, and flat. *Interior* border of two, opposite, lanceolate, expanding lobes. *Filament* very long, curved ; *base* tubular and winged, with a bifid, cuneiform, yellow lip or apron, above it is grooved for the reception of the style. *Anther* two-lobed ; each lobe bending in a long curved spur. *Germ* beneath, oval. *Style* filiform. *Stigma* funnel-shaped, mouth ciliate. I have not seen the fruit.

I. 80

6. G. *Careyana. R.*

Leaves ovate-lanceolate, villous underneath. *Racemes* terminal, compound, bulbiferous. *Corol* with the two segments of the inner border as long as the lip. *Anther* naked, sub-orbicular.

From Pegue this pretty little plant was introduced by Mr. F. Carey into the Botanic garden near Calcutta, where it flowers in August.

Root tuberous, about biennial, perishing at one end, and shooting forth at the other. This may be considered the general habit of all the species. *Stems* numerous, oblong, as thick as a slender ratan, about eighteen inches high, and invested in the sheaths of the leaves. *Leaves* sessile on their sheaths, alternate, bifarious, from broad-lanceolate to ovate-oblong, very finely acuminate, villous underneath ; about six inches long, by two broad. *Sheaths* villous on the outside, scarcely ending in any ligula, but rising a little on each side. *Racemes* terminal, erect, composed of little, alternate fascicles, of about three flowers each, supported on very short, common pedicels ; each of the lowermost of them produces a small, obovate bulb, and two or three more between the racemes and the leaves. *Flowers* numerous, small, of a deep orange colour. *Bractes* concave, acute, one to each fascicle ; and a smaller coloured one to each flower ; all caducous. *Calyx* superior, tubular, three-toothed, coloured. *Corol ; exterior border* of three, nearly equal, oval lobes ; *Interior* of two linear lobes, which are as long as the lip ; soon after expansion they are reflected back over the exterior border, but become involute before the flower drops. *Lip* a little elevated above the five segments of the exterior border, bifid at both ends. *Filament* long, incurved, &c. as in the genus. *Anther* broad, ovate, or nearly round, with its two polleniferous cells within, projecting at the sides a little beyond its periphery, but without any other kind of appendage, as in most of the other species. *Germ* round, rugose, one-celled, containing many ovula, attached to three parietal receptacles. *Style* length of the corol and filament, filiform, taking a more direct course to the anther than the groove of the filament. *Stigma* funnel-shaped, ciliate. *Capsule* globular, size of a large marrow-fat pea, warted, one-celled, three-valved. *Seeds* several, attached to the middle of the valves of the capsule, round-ovate, resting on a large spongy pedicel. *Integuments* two ; *exterior* firm, light brown, a little villous ; *interior* membranaceous. *Perisperm* conform to the seed, hard, and friable, even while fresh. *Vitellus* in small quantity, clear, lining the inside of the upper part of the cavity of the perisperm so as to embrace the upper half of the clavate embryo.

I. 81

7. G. *subulata. R.*

Panicles radical. *Filament* with a subulate wing on each side near the base ; *anthers* semilunar, winged.

Found wild in the forests of Chittagong by Mr. W. Roxburgh, and by him introduced into the Botanic garden near Calcutta, in 1801 ; where it blossoms in April, May, and June, during which period the new foliage also appears above the ground. There is a constant succession of flowers from the extremities of the lengthening branches of the panicle, for nearly two

Page Carey Ed. months, which renders this lovely plant one of the most charming of the whole natural order that I have yet with. The specific name is taken from the shape of the wings of the filament.

Root perennial, composed of numerous, diverging, fleshy fibres, some fusiform, some columnar. *Stems* annual, bending a little to one side; from one to two feet high. *Leaves* alternate, bifarious, sessile on their sheaths, lanceolate, with a long, withered, filiform point; villous on both sides; from six to nine inches long, and about one and a half broad. *Sheaths* I. 82 smooth, keeled; *ligula*, or stipulary process truncated. *Scapes* radical, from three to four inches long, often several arise from the same cluster of roots, erect, enveloped in three or four, alternate, smooth, short sheaths. *Panicle* erect, about a foot high, including the scape, and expanding nearly as much, the whole a very lively bluish purple. *Ramifications* alternate, long, simple, diverging, bearing in succession numerous, alternate, sessile, small, lovely purple and yellow flowers. *Bractes* solitary, light purple, smooth; those of the ramifications oblong; those of the flowers cordate. *Flowers* solitary, sessile in the axills of their proper bractes. *Calyx* superior, clavate, smooth, light purple; mouth three-toothed, permanent, with the lower half of the tube of the corol. *Corol; tube* long and very slender; the lower half, which is inclosed in the tube of the calyx, projecting horizontally; the upper half erect; at the angle, which those portions of the tube make with each other, and which is nearly a right one, the flower drops, leaving the lower half to wither. *Border* single and three-parted; upper division erect, pressing on the back of the base of the filament, oblong, boat-shaped; lower two divisions obliquely cordate, and reflexed, all the three are of a light purple colour. *Lip* cuneate, deeply two-parted, much larger than the divisions of the exterior border, deep orange yellow, forming a pretty contrast with the lively purple of every other part of the panicle. *Filament* very long, very slender, on the first day much incurved, afterwards revolute, finely grooved on the underside for the reception of the style; near the base are two, very long, slender, flat, subulate, diverging, recurved wings. In my other six species with terminal inflorescence, these are entirely wanting, but the inner two-lobed border is present. *Anther* double, and enlarged at the sides with two, broad, reniform wings. *Germ* beneath, oval, with nine longitudinal ridges, a transverse section exhibits one cell only, with numerous seeds, affixed to I. three parietal receptacles. *Style* most slender. *Stigma* funnel-shaped. *Capsule* globular, 83 purple, size of a small cherry, six-ridged, one-celled, three-valved, opening spontaneously from the apex. *Receptacle* a longitudinal ridge on the inside of each valve. *Seeds* many, minute, oblong, villous, connected by a large, white, spongy membrane to the parietal receptacles.

8. G. *Spathulata. R.*

Panicles radical. *Filaments*, with a spatulate wing on each side near the base; *anthers* semilunar, winged.

This second, beautiful species, with large azure coloured, radical inflorescence, is a native of the vallies on the north and eastern boundaries of the province of Silhet, and from thence was introduced by Mr. M. R. Smith into the Botanic garden near Calcutta, where it flowers in April, at which time the foliage begins to appear. At the beginning of the cold season it perishes down to the root.

Panicles radical, erect, oblong, from eight to twelve inches high, composed of many, diverging, simple, lengthening branches, every part, bracte included, of a pretty, light azure colour. *Bractes* oval, and oblong, concave, a larger one under each branch of the panicle, and one to each flower. *Flowers* numerous, produced in a continued succession for several weeks on the same panicle. *Perianth* superior, widening to its three-toothed mouth. *Corol; tube* long, slender, curved, and villous. *Border* three-lobed; lobes nearly equal and equally arranged, shape oblong, and concave. *Lip* as in G. *subulata*, but less divided; yellow, as in that species. *Filament* long, slender, recurved, &c. as in the genus; near the base, instead of an inner border to the corol, there is a spatulate, diverging wing on each side. From its shape the specific name is taken, and readily distinguishes this species from subulate, which it very exactly resembles when in flower. *Anther* with a semilunar wing on each side. *Germ* one-celled, containing many ovula, attached to three parietal receptacles.

I. 84

SALICORNIA. Schreb. gen. N. 14.

Calyx gibbous like an aril lining the inside of the cavities of the fructification in the joints. *Corol* none. *Seed* one.

1. S. *brachiata. R.*

Perennial, erect; *branches* numerous, decussate, joints clubbed. *Spikes* cylindric.

Teling. Quoiloo.

This seems an undescribed plant; nor can I collect what Dr. König thought it was. It is a small, generally erect, perennial species, growing plentifully on such low, wet, salt ground as is overflowed by the spring tides. Flowers all the year round. It should be compared with S. *herbacea.*

Stems generally erect, woody, about as thick as a goose-quill, though sometimes at the base as thick as the little finger; from twelve to eighteen inches high. *Branches* decussate, ascending, very numerous, divided, and subdivided in the same manner; their extremities are the succulent, cylindric jointed spikes. *Joints* of the spikes, or leaves, thick, succulent, annular, cap-like, portions, that closely surround the extremities of the filiform, woody branchlets, like beads strung on a thread; above they are concave, with two opposite elevations, the lower convex end of the next leaf above enters this concavity; these elevations, like the branches, are decussated with those of the next above and below, with a ring. *Flowers* conspicuous, three-fold, (three on each side of each joint,) opposite. *Calyx*, a flask-like fleshy substance, with a longitudinal slit for the stamen, and style; they adhere firmly to one another

and to the substance of the leaf, till the seed is ripe. *Corol* none. *Stamens* constantly one. *Anther* sagittate. *Stigma* two-cleft. *Capsule*, no other than the calyx now dry, which separates, and drops with its single seed. Page Carey Ed. I. 85

2. S. *indica. Vahl. enum. pl.* 1. 10.

Perennial, diffuse; joints gibbous. *Spikes* cylindric; *flowers* hid.

Beng. Jodoo Palung.

Teling. Quoia-pipaly.

This is also very common, and grows with the former on similar ground.

Stems and large *branches* woody, diffuse over an extent of some feet; the latter sometimes alternate, sometimes opposite, those that are young, and covered with the leaves are ascending, or nearly erect. *Joints*, or leaves longer than in the former species, but in other respects the same. *Floral joints* or leaves, very short. *Spikes* terminal, cylindric, erect, obtuse. *Flowers* inconspicuous, opposite, three-fold, hid by the upper margin of the next floral leaf below. *Calyx* as in the former. *Stamen;* in this species I have never been able to discover even the rudiments of one. *Pistil*, &c. as in the former.

Obs. Cattle will not eat these plants, although their taste is simply saltish. These two species are very plentiful on the coast of Coromandel, where large quantities of the fossil alkali might no doubt be made at a low rate. Such manufactures deserve much encouragement, particularly here, where there are many more labouring people* than can possibly find employment. Large quantities of this substance are annually imported into England from the Mediterranean, for making soap, glass, &c. It is worth about twenty-eight or thirty shillings per cwt. and as labour is cheap on this coast, the alkali might be made, I think, at so low a rate as to admit of its being sent to England, and paying a freight of £10 the ton, or more; provided it could be there imported duty free.

CLASS II. I. 86

DIANDRIA MONOGYNIA.

NYCTANTHES. Schreb. gen. N. 21.

Calyx campanulate. *Corol* salver-shaped. *Capsule* superior, obcordate, compressed, two-celled, two-valved. *Seeds* solitary. *Embryo* erect, without perisperm.

1. N. *arbor tristis. Linn. spec. plant. ed. Willd.* 1. 35.

Parlium arbor tristis. *Gært. Sem.* 1. 234. *t.* 51.

Scabrita scabra. *Vahl. Symb.* 2. 28. *Gært. Sem.* 2. 265. *t.* 128.

Scabrita triflora. *Linn. Mant.* 1. *p.* 37.

Manja pumeram. *Rheed. Mal.* 1. *p.* 35. *t.* 21.

Sephalica. *As. Res.* 4. 244.

Sans. Hind. and *Beng.* Singahar, Sewly, Nibari, Harsinghar, &c.

Of what country this is a native I know not, for I have never found it but in a cultivated state; and it is always raised from seed, which may be the reason we have no varieties of this most delightfully fragrant plant. In our gardens it is found in the state of a large shrub, or small tree. Flowers on the Coast nearly the year round; in Bengal only during the rains. The seeds ripen in the cold season.

Trunk erect. *Bark* scabrous. *Branches* numerous, spreading in every direction; the young shoots alone are four-sided; four ligneous, cord-like nerves, under the bark, forming the angles. *Leaves* opposite, short-petioled, cordate, those near the flowers oblong, pointed, sometimes entire, sometimes very grossly serrate, and sometimes the lower parts are angular; scabrous; from three to five inches long, and from one to three broad. *Inflorescence* a large, terminal, leafy, cross-armed panicle, composed of small, five-flowered, terminal umbellets. I. 87 *Flowers* numerous, middle-sized, exquisitely fragrant, open at sun-set, and fall off at sun-rise; the tube orange-coloured, and the border white. *Involucre* to the umbellets four-leaved, leaflets inverse-cordate, opposite, sessile. *Calyx* campanulate; mouth a little contracted, and lightly five-notched, downy, withering. *Corol; tube* cylindric, length of the calyx. *Border* spreading, from five to eight, but generally six or seven parted, contorted; *segments* triangular, or obliquely lobed, exterior margin scolloped. *Filaments* scarcely any. *Anthers* two-lobed, sitting within the tube. *Germ* above, compressed. *Style* length of the tube. *Stigma* headed, glandular. *Capsule* size of a man's thumb nail, obcordate, or nearly orbicular, compressed, two-celled, two-valved, opening transversely from the apex. *Seeds* one in each cell, compressed, &c. as described and figured by Gærtner; I have not, however, been able to detect any thing like a perisperm.

Obs. The flowers of this tree are exquisitely fragrant, partaking of the smell of fresh honey, and on that account the plant is much esteemed; for when destitute of flowers it has but an indifferent appearance. The orange tubes of the flowers dye a most beautiful buff or orange colour, with the various shades between them, according to the preparation, and mode of conducting the operation; but unfortunately, no way has yet been discovered of rendering this elegant colour durable.

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* This was written before the famine of 1791, 2, and 3; the case is now (1794) different, as fully half, if not more of the labouring classes were carried off by that deplorable calamity.

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JASMINUM. Schreb. gen. N. 22.

Corol salver-shaped. *Germ* two-celled, one-seeded.* *Berries* one or two, superior. *Seed* solitary. *Embryo* erect, without perisperm.

1. J. *Zambac. Willd.* 1. 35.

Shrubby, twining. *Leaves* opposite, sub-sessile, from cordate to oblong, acute, or obtuse. *Segments* of calyx subulate. *Berries* globular.

Magorium Sambac. *Lamarck. Encycl.* iv. 210.

Of this we have three varieties, viz.

1*st. Single-flowered Arabian Jasmine*, which I suppose to be,

Jasminum undulatum. *Willd.* 1. 36.

Tsjiregam-Mulla. *Rheed. Mal.* 6. *p.* 97. *t.* 55.

Mallica, and Asphota, *As. Res.* 4. *p.* 245, are I suspect both this variety. The first is found in gardens, though a small flower, and the second wild in hedges, &c.

Beng. Bun-mulika ; or Deshi-mullika.

2*d. Double-flowered Arabian Jasmine.*

Nalla-mulla. *Rheed. Mal.* 6. *p.* 87. *t.* 50.

Jasminum Limonii folio conjugato. *Burm. zeyl.* 128. *t.* 58. *f.* 2.

Flos Manoræ. *Rumph. Amb.* 5. *p.* 52. *t.* 30.

Sans. Suptala, Nuva-mullika. See *As. Res. l. c.*

Beng. Bela, or mulika.

3*d. Great double Arabian* or *Tuscan Jasmine.*

Beng. Mootta-bela ; Bura-bela, or Patna mullika.

Kudda-mulla. *Rheed. Mal.* 6. *p.* 89. *t.* 51.

Flos Manoræ plenus. *Rumph. ibid.*

Septala. *As. Res. l. c.*

All the varieties flower during the rains chiefly.

The single variety of this plant, (which is the one described,) is one of the most common in every forest on the Coast. Birds eat the berries, and drop the seeds, which vegetate. In this way, I account for its being so general. Flowers during the hot season. I. 89

Stem and *branches* woody, twining. *Bark* scabrous on old plants. *Leaves* opposite, short-petioled, cordate-ovate, or oblong-waved, sometimes scollopped, pointed, smooth, except when young ; in the axills of the veins on the back of the leaves there are tufts of down, as in some species of *Gardenia*. *Flowers* terminal, generally forming small, trichotomous umbellets, white, fragrant. *Calyx* bordered with from five to nine, long, subulate, permanent segments. *Stigma* clubbed. *Germ* two-lobed, one ovulum in each, attached to the lower part of the partition. *Berries* twin ; each round, smooth, juicy, one-seeded, when ripe of a beautiful shining black. *Seed* conform to the berry ; integument single. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed. *Radicle* small, inferior.

Obs. From this species we have the common double ; and rose, or great-flowered, and full *Moogaries, (Arabian,* or *Tuscan Jasmines ;)* these are always raised from layers, and have been improved by culture into their present state as above noted.

The plant that bears the common double sort still retains its twining habits, but it is lost in the great rose, or full-flowered sort ; here the branches are erect, or spreading, but never twining.

I am inclined to think that *Nyctanthes undulata, sp. pl.* 2. *p.* 8. is only a variety of this species, arising from soil, culture, &c. for with the utmost attention, I could never discover any thing like a fixed specific character to distinguish it from *Zambac*, as the number of petals or divisions of the corol are inconstant, and at most mark only the variety.

2. J. *scandens. Willd.* 1. 37.

Shrubby, twining, and scandent, smooth. *Leaves* opposite, simple, cordate-oblong, entire, taper-pointed. *Corymbs* terminal, globular, trichotomous. *Calycine segments* six or seven, bristle-shaped, of the corol six to eight, lanceolate, very acute, nearly the length of the clavate tube. *Stigma* bilobate. I. 90

Nyctanthe *scandens. Retz. Obs. fasc.* 5. *p.* 9.

A native of the southern parts of Bengal. The plants in the Botanic garden near Calcutta were reared from seed sent from Chittagong ; which after they were two years old began to blossom in January and February, and continue so to do, but have not produced good seed.

Trunk none, but many, long, ligneous, at first scandent, but finally twining, round, smooth branches of considerable extent. *Leaves* simple, opposite, short-petioled, cordate-oblong, tapering from near the somewhat re-entering base, fine-pointed, entire, smooth, and rather lucid on both sides : from one to six inches long, and from half an inch to two inches broad. *Petioles* flattened, channelled. *Corymbs* terminal, sub-globular, dense, that which terminates the larger branches more compound. *Peduncles* short, with the *pedicels* still shorter, all are villous. *Flowers* numerous, pure white, delightfully fragrant. *Calyx* villous, border of six, or seven, bristle-shaped, spreading, villous segments. *Tube* of the corol widening to the mouth, and more than twice the length of the segments of the calyx. *Border* of from six to eight, lanceolate, acute segments, which are rather shorter than the tube. *Germ* turbinate, two-celled, with one seed in each, attached to the thickened middle of the partition.

3. J. *elongatum. Linn. sp. pl. ed. Willd.* 1. 37.

* In all the species hereafter mentioned, there is a two-lobed, two-celled germ, with one seed in each, attached to the upper end of the partition ; and succeeded by two one-seeded berries, when both come to maturity.

Scandent. *Leaves* opposite, and alternate, lanceolate, villous on both sides. *Corymbs* terminal. *Corol* eight or twelve-cleft; *segments* linear. *Stigma* bifid. Page Carey Ed.

Nyctanthes *elongata. Linn. suppl.* 82.

A native of the forests about Hidgelee, near the mouth of the Hooghly in Bengal. Flowering time the beginning of the hot season.

Stem woody, straggling to a considerable extent, or climbing. *Bark* of the woody parts light ash colour; of the young shoots very villous. *Leaves* opposite, and alternate; short-petioled, from lanceolate to ovate-lanceolate; very soft with fine down in both sides; length from one to five inches. *Flowers* terminal, from simply tern to a large compound corymb, pretty large, pure white, fragrant. *Pedicels* clavate, villous. *Bractes* short, subulate, villous. *Calyx* villous, five or six-cleft; *divisions* short, and subulate. *Corol; tube* swelling towards the mouth, much more than the calyx. *Border* of from six to twelve, linear, spreading divisions with margins revolute. *Filaments* short. *Anthers* lodged just within the mouth of the tube of the corol. *Germ* turbinate. *Style* so long as to elevate the two-lobed *stigma* so as to make it level with the anthers. I. 91

Obs. The species differs from my *arborescens* in being scandent, and in the shape of the leaves, as well as in the pubescence; here they are lanceolate, and very villous; there cordate and smooth.

4. J. *pubescens. Linn. sp. pl. ed. Willd.* 1. 37.

Leaves cordate, downy. *Umbels* terminal, sessile, many-flowered.

Katu-Tsjiregam-Mulla. *Rheed. Mal.* 6. *p.* 95. 1. 54.

Nyctanthes *multiflora. Burm. Flor. Ind. p.* 5. *t.* 3. *f.* 1.

Nyctanthes pubescens. *Retz. Obs.* 5. 9.

Sans. Maghyun, Koondum. See *Asiat. Res.* 4. 244.

Beng. Koonda.

A very ramous shrub, brought orignally from China into the Company's Botanic garden. It is also indigenous in Bengal. Is in flower during the rains chiefly.

Stem scarcely any; *branches* numerous, covered with ash-coloured bark; the young parts very downy. *Leaves* opposite, short-petioled, cordate, entire, downy, particularly while young; the terminal ones crowded (involucre-like) round the umbels. *Umbels* terminal, sessile, tending to be trichotomous, containing from ten to thirty, sessile flowers; downy in all parts. *Flowers* large, pure white, fragrant. *Bractes* few, lanceolate. *Calyx* six-cleft; border of the corol from six to nine-parted; *divisions* lanceolate. *Stamens* within the tube. *Anthers* beaked. *Germ* two-lobed, two-celled, with one ovulum in each, attached to the upper part of the partition. I. 92

Stigma entire, clubbed.

Obs. This is a goodly looking plant, its numerous, large, pure white, fragrant flowers, opening in succession make it very desirable.

5. J. *laurifolium. R.*

Scandent, polished. *Leaves* opposite, ovate-lanceolate, lucid, three-nerved. *Flowers* axillary, and terminal, from one to five, long-peduncled. *Calycine segments* six or seven, filiform; those of the corol from nine to twelve, linear, length of the tube.

A very elegant, climbing and twining, highly polished, shrubby species; a native of the mountainous countries east of Bengal, where it flowers during the cool season.

Leaves opposite; sub-sessile, lanceolate, firm and glossy; margins entire, somewhat thick, faintly three-nerved, from two to four inches long, and from one to two broad. *Peduncles* terminal and axillary, sometimes single, sometimes several together, and sometimes, when terminal, sub-racemed; long and slender. *Bractes* opposite, subulate. *Calyx* from five to seven-cleft; *segments* long, slender, subulate, and smooth. *Corol; tube* twice the length of the calyx, sub-clavate; *border* of from nine to twelve, ensiform, spreading segments, which are as long as the tube. *Stamina* within the tube. *Germ* two-celled, with one ovulum in each, attached to the middle of the partition. *Style* and *stigma* clavate, scarcely reaching to the anthers.

6. J. *coarctatum. R.*

Shrubby. *Leaves* oblong, smooth, acute. *Corymbs* terminal, peduncled, crowded with ternate, sub-sessile flowers, and amply bracted. *Calyx* five-cleft. I. 93

A very ramous shrub, without any tendency to ramble or climb. It is the first simple-leaved Indian *Jasmine* I have found which has not that habit. Is a native of the hills near Chittagong, where it flowers in April and May; may be readily known, without any other mark, by the great number of flowers which form the little dense corymbs.

7. J. *trinerve. Vahl. Symb.* 3. *p.* 2.

Scandent, polished. *Leaves* ovate-lanceolate, long-acuminate, three-nerved, polished. *Flowers* axillary and terminal, solitary. *Calycine segments* six or seven, subulate; those of the corol six or eight, sub-filiform, and longer than the long tube.

A native of the forests near Silhet, where it blossoms in March and April, and the berries ripen in June.

Stem and *branches* together, some fathoms in extent, running up, and over large shrubs and trees. *Bark* of the old woody parts ash-coloured and rather rough; *tender shoots* polished, deep green. *Leaves* opposite, petioled, ovate-lanceolate, long, fine-pointed, firm and glossy, three-nerved, three or four inches long, and one or one and a half broad. *Petioles* short, with a remarkable joint near the middle. *Flowers* terminal and axillary, solitary, sub-sessile, very large, white and sweetly fragrant. *Calyx* with a short, smooth tube, border of about six subulate segments which are nearly half the length of the tube of the corol. *Corol; tube* long, widening above the middle for the stamina; *border* of six to eight slender, spreading

Page Carey Ed. segments, which are an inch and a half in length. *Filament* short. *Anthers* linear, lodged about the middle of the tube of the corol. *Germ* oval, two-lobed, two-celled, with one ovulum in each, attached to the partition. *Style* length of the tube of the corol. *Stigma* bifid.

Obs. The flowers were solitary the first year the plants were in the Botanic garden,
I. 94 but during the rainy season of the second year there were usually nine.

8. J. *bracteatum. R.*

Twining. *Leaves* opposite, ovate-oblong, acute, villous. *Flowers* in terminal bracted fascicles of three, five, or eleven flowers. *Calycine segments* from five to seven, subulate; those of the corol from five to eight, oblong, with rounded acuminate apices. *Style* longer than the tube. *Stigma* entire.

A native of the island of Sumatra. From Bencoolen Dr. C. Campbell sent plants to the Botanic garden, under the name *Coast Jasmine.* In Bengal they blossom during the cool, and the beginning of the hot season; the seed ripens in April.

Stem scarcely any; *branches* numerous, ligneous, climbing and twining, extending up and over trees of considerable size; tender parts round, and clothed with much, very soft, short, pale green down. *Leaves* simple, opposite, short-petioled, ovate-oblong, acute, entire, downy, two or three inches long, and one or two broad. *Flowers* numerous, pretty large, white, fragrant, in terminal fascicles of generally three, or five, sub-sessile ones, or growing on short, axillary branchlets; embraced by one, or two pair of large bractes, and by a greater number, when the fascicle terminates a primary branchlet; the addition in this, as in most of the other Indian species, proceed in opposite pairs of three-flowered peduncles. *Bractes* opposite, always two, generally unequal pairs, of an ovate-cordate shape, under each fascicle, and some small subulate ones within them, all villous, like every other tender part of the plant. *Calyx* downy. *Tube* short. *Segments* five, six, or seven, subulate. *Corol* smooth. *Tube* twice the length of the calyx, sub-cylindric. *Border* of from five to eight, oblong segments, rounded at the apex, with a small point in the middle. *Germ* two-celled, one ovulum in each. *Style* longer than the tube of the corol. *Stigma* entire, linear, with a groove on each side. *Berries* one or two, united from the middle downwards, size of a large pea, oval,
I. smooth, succulent, and of a shining black colour when ripe, one-celled. *Seed* single, oval.
95 *Integuments* two; *exterior* composed of woolly fibres; *inner* thinner and more tender, both dark, brownish black. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, green. *Plumula* two-lobed. *Radicle* patelliform, inferior.

9. J. *latifolium. R.*

Shrubby, twining. *Leaves* opposite, petioled, cordate. *Corymbs* terminal; *calycine segments* from five to seven, subulate; those of the corol from ten to twelve, linear, and cuspidate. *Berries* kidney-shaped.

Teling. Adivi-mulli.

To the best of my knowledge, this species is a native of the mountainous parts of the Circars only. It is much larger than the other species, though like them it has a woody twining, or climbing stem, but its branches are in general straight and spread. *Branchlets* opposite, smooth. *Leaves* opposite, petioled, varying from oblong to broad-cordate, pointed, entire, smooth; size various. *Corymbs* terminal, divided by threes, diffuse. *Flowers* large, white, fragrant. *Calyx* with a short tube, and seldom more than five-cleft border. *Corol* tubular; *border* from eight to twelve-cleft; *segments* slender, and patent. *Berries* one or two; when single oblong; when two kidney-shaped.

10. J. *arborescens. R.*

Arborescent. *Leaves* opposite, and three-fold, oblong, downy. *Flowers* terminal, numerous, corymbiform, border from ten to twelve-cleft. *Stigma* two-lobed.

Sans. Suptula, Nuva-mullika.

Beng. Bura-Koonda, Nuva-mullika.

Nyctanthes *grandiflora. Loureir. Cochin Ch.* 26.

A native of the more elevated parts of Bengal, where it blossoms about the beginning of the hot season.

I. *Trunk* scarcely any; *branches* many, stout, woody, sub-erect, covered with smooth, ash-
96 coloured bark; *young shoots* round, and somewhat villous. Height of the whole tree ten or twelve feet. *Leaves* opposite, rarely three-fold, or alternate, short-petioled, ovate-cordate, acuminate; margins entire, and often waved, smooth on both sides; from two to four inches long, and from one to three broad. *Petioles* channelled, jointed near the middle. *Flowers* on terminal, trichotomous, three-flowered peduncles, often forming large, corymbiform panicles; they are large, white, and very fragrant. *Bractes* subulate, villous. *Calyx* crowned with five or six subulate, incurved, villous divisions. *Corol; tube* longer than the calyx. *Border* of ten or twelve, somewhat acute, linear divisions. *Anthers* ovate, within the tube. *Germ* turbinate, two-lobed, two-celled, with one ovulum in each, attached to the upper part of the partition. *Stigma* two-lobed, about half way up the tube of the corol.

Obs. This species is nearly allied to my J. *latifolium,* and indeed the only specific difference I have yet been able to observe, is, that this species has no tendency to twine or climb; that is twining.

11. J. *angustifolium. Vahl. en. pl.* 1. 29. *Linn. sp. pl. ed. Willd.* 1. 36.

Shrubby, twining; polished. *Leaves* opposite, petioled, ovate, smooth, of a shining deep green. *Flowers* terminal, one, two, or three; *corol* eight or nine-parted. *Berries* single, ovate.

Nyctanthes triflora. Burm. Ind. 4. *t.* 2.

J. vimineam. Willd. loc. cit.

Katu-pitsjegam-Mulla. *Rheed. Mal.* 6. *p.* 93. *t.* 53.

This is much like *Burman's* figure quoted above, but does not accord with his character of alternate leaves; it is very common, and at the same time one of the most beautiful species of Jasmine I know. It abounds in every forest on the coast of Coromandel. Blossoms during the hot season; but in a state of cultivation flowers are produced the greatest part of the year. Page Carey Ed. I. 97

Stem and *branches* woody, twining, smooth. *Leaves* opposite on every part of the shrub, short-petioled, ovate-oblong, or oblong, sometimes nearly cordate, finely-pointed, smooth, shining, firm, very deep green, veinless. *Flowers* terminal, generally three-fold, peduncled, large, white, with a faint tinge of red, star-shaped, having a peculiar but very pleasant fragrance. *Peduncles* clubbed, smooth. *Calyx; tube* short; *segments* acute. *Corol; border* generally eight or nine-parted; *divisions* lanceolate. *Style* short. *Stigma* lanceolate. *Berries* oblong.

Obs. I have for many years cultivated this species. It grows easily in every soil and situation, is constantly covered with leaves, and their bright, shining deep green colour, renders it always beautiful, and particularly well adapted for screening windows, covering arbours, &c.

12. J. *tubiflorum. R.*

Scandent. *Leaves* sub-sessile, ovate-oblong, smooth. *Flowers* terminal, from three to five, short-peduncled. *Calycine segments* from seven to eight, subulate, one-sixth the length of the very long slender tube of the corol. *Berries* ovate.

A native of the Malay Archipelago, differs from all the other Indian species hitherto examined by me in the great length of its slender tube, which is three times longer than the seven or eight, lanceolate segments of its border.

13. J. *simplicifolium. Linn. sp. pl. ed. Willd.* 1. 38.

Shrubby, spreading. *Leaves* oblong, polished. *Flowers* from three to many terminal. *Border* of the corol of from six to eight, linear, acute segments, equalling the tube in length.

Native place, the Friendly Islands, and the Eastern Archipelago, &c. Flowering time in the Botanic garden the hot season. It does not ripen seeds in Bengal.

Trunk scarcely any; *branches* many, stout, ligneous, round, smooth; *branchlets* spreading in all directions. *Leaves* simple, opposite, short-petioled, oblong, entire; highly polished on both sides; about two inches long, and about one broad. *Flowers* terminal, from three to a decussate panicle, with its ramification trifid. *Pedicels* clavate, round, smooth. *Bractes* minute, subulate. *Calyx* campanulate, with a five-toothed border. *Corol; tube*, many times longer than the *calyx*. *Border* from six to eight-parted; *divisions* linear, acute, about as long as the tube. *Anthers* half erect. *Style* shorter by half than the tube of the corol. *Stigma* two-cleft. I. 98

14. J. *auriculatum. Linn. sp. pl. ed. Willd.* 1. 38.

Shrubby, twining. *Leaves* sub-ternate, leaflets ovate, the pair minute or wanting. *Border* of the calyx with five, obscure, glandular teeth. *Corol* seven-cleft. *Berries* globular.

Sans. Magudhee, Gunika, Yoot'hika, Umbustha. See *Asiat. Res.* iv. 246.

Beng. Jut'hi, or Jui.

This species is a native of various parts of India, but not common. Its habit is twining, with a woody stem, and branches.

Leaves opposite, ternate. *Leaflets*, the pair very small, standing opposite, sometimes wanting; the terminal one at least ten or fifteen times larger; all ovate, entire, with a minute point, smooth, except when young, when they are downy. *Corymbs* terminal, always three-forked, dense. *Flowers* small, white, sweet-smelling, though less fragrant than those of the former species. *Calyx* five-notched, with a round firm glandular process on the outside of each. *Corol; border* from five to eight-cleft, divisions oblique, obtuse. *Stigma* clavate. *Berry* exactly as in *Sambac.*

15. J. *lanceolaria. R.*

Shrubby, erect. *Leaves* ternate; leaflets lanceolar. *Corymbs* terminal.

A native of the jungles or copses of Silhet, where it blossoms in May. I. 99

16. J. *paniculatum. R.*

Shrubby, erect, every part polished. *Leaves* ternate; *leaflets* oval, obtusely acuminate. *Panicles* terminal.

Sam-yeip-son-hing of the Chinese.

From Canton in China this fine erect, shrubby, highly polished species was received into the Botanic garden, where it blossoms during the rains. The leaflets are from oval to oblong, with an obtuse point, polished, of a hard texture. The flowers are small and white, but numerous, on terminal pretty large open, brachiate panicles.

17. J. *chrysanthemum. R.*

Shrubby, erect. *Leaves* alternate, pinnate; *leaflets* three, five, or seven, lanceolate. *Corymbs* sub-terminal. *Calycine segments* attenuate.

Hemapushpica, or yellow yuthica. *Asiat. Res.* iv. 246.

Sans. Hema-psoohpika.

A native of the mountainous countries north of Hindoostan. Colonel Hardwicke found it on his journey to Sirinagur, (see *Asiat. Res.* vi. 349. Jasminum, No. 3.) and Dr. Buchanan in Nepal. In the Botanic garden it grows freely from cuttings, and becomes a stout, erect ramous shrub, even a small tree, without the smallest tendency to lean, or twine. Flowers more or less the whole year; but, like the other species, the proper season is April and May, at which time it is the most desirable Jasmine I have yet seen.

Stem stout and woody, in plants seven or eight years old as thick as a man's leg. *Bark* smooth, ash-coloured. *Young shoots* erect, flexuose, angular, smooth; height of the shrub from eight to twelve feet. *Leaves* alternate, unequally pinnate; at the base of the young

Page Carey Ed. I. 100

shoots ternate or even sometimes solitary. *Leaflets* two, or more generally three pair, and a terminal one; opposite, lanceolate, smooth, dark green, but not glossy; from one and a half to three inches long. *Corymbs* generally terminal, from ten to twenty-flowered, as in the figure of *Jasminum odoratissimum, in Curtis's Bot. Mag. No.* 285. *Flowers* large, bright yellow, delightfully fragrant. *Bractes* ensiform. *Calycine segments* five, alternate, nearly as the tube of the calyx. *Segments* of the corol five, oval, obtuse, length of the tube. *Filament* short. *Anthers* linear, with their apices rather above the mouth of the tube of the corol. *Germ* two-celled, with two ovula in each, attached to the middle of the partition. *Style* half the length of the tube. *Stigma* clavate.

18. J. *grandiflorum. Linn. sp. pl. ed. Willd.* 1. 41.

Shrubby, scandent (in India). *Leaves* opposite, pinnate; *exterior* three or five leaflets confluent. *Peduncles* terminal.

Catalonian, or Spanish Jasmine.

Pitsjigam mullo. *Rheed. Mal.* 6. *t.* 52.

Sans. Soomuna, Malutee, Jati.

Beng. Jatee.

This plant I have only found in gardens, where it flowers the greater part of the year.

19. J. *heterophyllum. R.*

Shrubby. *Leaves* alternate, petioled, simple, sometimes ternate, ovate-lanceolate, waved, lucid, finely acuminate.

A stout shrubby species, a native of Nepal. In the Botanic garden its branches are weak and variously bent; the bark roughened with little elevated gray spots. While the plants are young the leaves are for the most part ternate, afterwards they are simple.

PHILLYREA. Schreb. gen. plant. N. 24.

Calyx four-toothed. *Corol* one-petalled, four-cleft. *Germ* two-celled, two-seeded. *Drupe* or *berry* superior, one or two-seeded. *Embryo* inverse, and furnished with a perisperm.

1. P. *paniculata. R.*

I. 101

Arboreous. *Leaves* opposite, ovate-oblong, entire, smooth. *Panicle* terminal.

A native of China and from thence introduced into the Botanic garden near Calcutta, before 1793. Now, 1802, they have grown to be beautiful small trees, of from fifteen to twenty feet in height, clothed almost to the ground, with numerous, opposite, spreading, and drooping branches, covered with smooth, ash-coloured bark.

Leaves opposite, petioled, drooping, ovate-oblong, sides incurved, entire, leathery, smooth on both sides, above a shining deep green, underneath glaucous, with two or more obscure glands near their base: from four to five inches long, and from two to three broad. *Petioles* short, recurved, channelled. *Stipules* none. *Panicles* terminal from the exterior axills, ramifications thereof opposite, and smooth. *Flowers* very numerous, rather small, pure white, somewhat fragrant. *Bractes* minute, caducous. *Calyx* obscurely four-toothed. *Corol* one-petalled; *tube* short; *segments* linear, revolute, smooth. *Filaments* opposite, inserted into the bottom of the tube of the corol, and about as long as the segments of its border. *Anthers* incumbent. *Germ* above, but lodged deep in the bottom of the calyx, two-celled, with two ovula in each. *Style* short. *Stigma* clavate, entire. *Drupe* size of a small French bean, obliquely obovate, smooth, generally one-celled. *Nut* solitary, with the rudiment of a second, but I never saw more than one come to maturity; pointed at the base, furrowed on the outside, covered with a thick, somewhat indurated envelope, though scarcely hard enough to be called a nut. *Embryo* inverse, lodged in a pearl-coloured amygdaline perisperm.

Obs. Ligustrum japonicum. *Thunb. Flor. Japan. p.* 17. *f.* 1. is a tolerably good representation of this tree; but the one-seeded nut, short style, and clavate stigma of my plant, will not allow me to think they can be the same.

2. P. *robusta. R.*

Leaves ovate-oblong, entire, acuminate. *Panicles* terminal, large and spreading. *Ber-*

I. 102

ries sub-cylindric, one-seeded.

Bhooeemoora, the vernacular name in Silhet, where it grows to be a very large tree, and furnishes the natives, &c. with very hard durable wood. Flowering time June and July; the seed ripens in January and February.

Young shoots void of pubescence, but dotted with small whitish specks. *Leaves* opposite, short-petioled, ovate-lanceolate, acuminate, entire, smooth; three or four inches long, and one or one and a half broad. *Panicles* terminal, large, very ramous; ramifications four, round, and villous. *Flowers* oblong, acute, villous. *Calyx* bowl-shaped, four-toothed. *Corol* campanulate. *Tube* very short; border four-parted. *Filaments* short, inserted on the little tube of the corol opposite to each other. *Anthers* oblong. *Germ* superior, depressed, two-celled, with two ovula in each, attached to the top of the partition. *Style* and *stigma* clavate, apex flat and emarginate. *Berries* (for they can scarce be called drupes) sub-cylindric, smooth, succulent, dark olive-purple, size of a large berry, rarely more than one-celled. *Seed* solitary, conform to the berry. *Integuments* two; *exterior* fibrous, and striated; *interior* rather thick, brown, adhering to the perisperm. *Perisperm* conform to the seed, oily. *Embryo* straight, nearly as long as the perisperm, inverse. *Cotyledons* lanceolate. *Radicle* cylindric, superior.

MILLINGTONIA. R.

Calyx three-leaved, calycled. *Corol* three-petalled, nectarial scale on the inside of each,

Germ two-celled, two-seeded. *Drupe* with one, or two-celled, two-valved nut; *seed* solitary. *Embryo* curved and folded, with little or no perisperm, and with a curved inferior radicle. Page Carey Ed.

Having found it necessary to deprive our countryman the late Sir Thomas Millington of the genus assigned to his memory by the younger Linnæus, *(Supl. 45 and 201)* because, on finding the ripe seed vessel of the only species thereof, I ascertained it to be a true *Bignonia* as I suspected; I have therefore restored that respectable name to the system, under a different dress, by giving it to the two trees which at present constitute this strongly marked family, and which, I am inclined to think, have not, until now, been described. I. 103

1. M. *simplicifolia. R.*

Leaves alternate, simple, broad-lanceolate.

A large tree, a native of Silhet, where it is called *Dantrungee* by the natives; the timber is used for various purposes. *Flowers* in February and March; seed ripens in July and August.

Leaves alternate, petioled, broad-lanceolar, tapering most toward the base, entire, or very remotely sub-serrate, in very young plants completely serrate, rather acuminate, smooth; veins simple and paralleled; from six to twelve inches long, by three or four broad. *Panicle* terminal, large, oblong, patent, brown, villous branches. *Flowers* numerous, sessile, very minute, yellow. *Bractes* oblong, clothed with ferruginous pubescence. *Calyx* three-leaved, independently of two or three minute, villous bractes, like a calycle; *leaflets* ovate, smooth, permanent. *Petals* three, broad-ovate, waved, twice the length of the calyx, permanent. *Nectary* a variously lobed, smooth scale from the base of each petal on the inside, they form a dome over the pistillum, and round the base of the germ is found a flat, triangular body, with its angles bidentate. *Filaments* two, opposite, incurved, inserted without the interior, three-angular nectary; bifid, the inner lamina supporting on its apex a patelliform receptacle, on which the two-lobed yellow anther rests. *Exterior lamina* bifid, *segments* subulate, rising rather higher than the anther. *Germ* superior, two-celled, with two ovula in each, attached to the thickened middle of the partition. *Style* single, short. *Stigma* obscurely two-lobed. *Drupe* size of a pea, nearly round, succulent, smooth, black, one-celled. *Nut* conform to the drupe, rarely more than one-celled, hard, cell somewhat angular; the second or abortive cell always traceable. *Seed* solitary, concave on the side next the abortive cell of the nut, hemispheric on the other. *Integument* single, membranaceous. *Perisperm* none. *Embryo* curved, and doubled, as in the *Convolvulaceæ*, with a curved inferior *radicle.* I. 104

2. M. *pinnata. R.*

Leaves alternate, abruptly pinnate; *leaflets* from six to twelve pair, sub-opposite, lanceolate.

Batiwa, the vernacular name in Silhet, where it is indigenous, growing to be a middling sized tree, the wood of which is employed by the natives in constructing their houses. Flowers in April and May. The seeds ripen in September.

Branchlets smooth. *Leaves* alternate, abruptly-pinnate; from six to eighteen inches long. *Leaflets* from six to twelve pair, sub-opposite, short-petioled, lanceolate, remotely serrate, acuminate, smooth, three to six inches long, by one or one and a half broad. *Panicles* terminal, very large and very ramous, a little hairy. *Bractes* minute. *Flowers* numerous, small, white. *Calyx* three-leaved, with two smaller ones under them, which may be called bractes or a calycle; or, the calyx may be called five-leaved. *Nectary*, from the inside of the base of each petal arises a variously lobed, ragged leaflet or scale, which is incurved over the germ; besides which round the base of the germ is a small, three-sided cup with bidentate angles. *Filaments* two, opposite, length of the germ, short, broad, with enlarged apex; from the base on the outside, rises a broad, tridentate scale, of about the length of the filament. *Anthers* twin, each lobe globular, opening transversely on the inside. *Germ* superior, cordate, two-celled, with two ovula in each cell, attached to the partition. *Style* short. *Stigma* small, bidentate. *Drupe* size of a pea, smooth, black, succulent, one-celled. *Nut* roundish, thick for its size and very hard, rugose, one-celled, two-valved, with a projection into the cell opposite to the remains of the style on one side near the base, which marks the abortive lobe. *Seed* solitary, conform to the nut. *Integument* single, membranaceous. *Perisperm* none, or in small quantity, and blended with the integument. *Embryo* curved, and folded up nearly as in the *Convolvulaceæ*. *Cotyledons* ovate-oblong. *Radicle* inferior, curved. I. 105

OLEA. Schreb. gen. N. 25.

Corol and *calyx* four-cleft. *Germ* two-celled, two-seeded. *Drupe* superior, one-seeded. *Embryo* inverse, and furnished with a perisperm.

1. O. *fragrans. Linn. sp. pl. ed. Willd.* 1. 4. 6.

Shrubby. *Leaves* oblong-lanceolate, slightly serrate. *Peduncles* axillary.

Olea *fragrans. Thunb. Jap.* 18. *t.* 2. good.

A native of China, in the Botanic garden it blossoms during the cool season.

2. O. *paniculata. R.*

Leaves opposite, petioled, oblong, entire, smooth. *Panicles* axillary. *Bractes* deciduous. *Lobes* of the stigma divaricate.

A small tree; a native of the Circar mountains. Flowers during the hot season.

Leaves opposite, petioled, oblong, waved, entire, running down the petiole, smooth on both sides, firm, about five inches long, and two broad. *Petioles* an inch and half long, smooth, flat above. *Stipules* none. *Panicles* below the leaves, and also from the axills, small, thin, branchlets. *Bractes* small, nearly sessile. *Calyx* four-cleft, small. *Corol* one-petalled;

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tube shorter; *border* four-cleft; *divisions* oblong, spreading, concave; *apices* sharp and incurved. *Filaments* two, opposite, short. *Anthers* large, oblong, erect. *Germ* superior, round. *Style* very short. *Stigma* two-cleft; *divisions* entire, acute. Ripe fruit not observed.

3. O. *dioica. R.*

Arboreous, dioicous. *Leaves* opposite, short-petioled, oblong, serrate. *Panicles* axillary.

Atta-jam, the vernacular name in Silhet, where it is indigenous; also on the hills of Chittagong. In both places it grows to be a pretty large tree, the timber of which is reckoned excellent, and put to many uses by the natives. Flowering time the month of March and April; fruit ripe in July.

Bark of the old ligneous parts ash-coloured; of the young shoots smooth and green. *Leaves* opposite, short-petioled, oblong, tapering equally at each end, remotely, and acutely serrate, acuminate, smooth, from four to eight inches long, by from two to four broad. *Stipules*, the oval concave scales of the buds only. *Panicles* axillary, and opposite, below the leaves, thin and not above half their length. *Male* flowers more numerous, small. *Calyx* four-toothed. *Corol* one-petalled, tube very short; *border* four-parted. *Filaments* two, very short, inserted on the short tube of the corol. *Anthers* oval, hid in the corol. *Germ* none, a small two-lobed gland supplies its place. *Female* on a separate tree, (probably HERMAPHRODITE, and in that case all the corols with the stamina, must have fallen off at a very early period; which I have no reason to think was the case, as they were examined at what I consider a proper age, and no traces of the place where a corol grew could be found.) *Calyx* as in the male. *Corol* none. *Germ* superior, ovate, two-celled, with two ovula in each, attached to the top of the partition. *Style* short. *Stigma* two-lobed. *Drupe* nearly round, in size and colour much like the common sloe, Prunus *Spinosa*, one-celled. *Nut* conform to the seed, thin and rather brittle than hard, one-celled. *Seed* solitary, conform to the nut. *Integument* single, thin. *Perisperm* conform to the seed, firm, pearl-colour. *Embryo* inverse, shorter than the perisperm, and considerably narrower. *Cotyledons* ovate-lanceolate. *Radicle* superior.

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CHIONANTHUS. Schreb. gen. N. 26.

Calyx four-parted. *Corol* one-petalled; *segments* long. *Germ* two-celled, two-seeded. *Drupe* superior, one or two-seeded. *Embryo* inverse, without perisperm.

1. C. *ramiflora. R.*

Arboreous. *Leaves* opposite, broad-lanceolar, entire. *Panicle* below the leaves.

A native of the Moluccas. Flowering time March and April. Seed ripe in September.

Trunk erect, *bark* smooth, ash-coloured; *branches* opposite; *young shoots* smooth, and round. *Leaves* opposite, petioled, broad-lanceolar, entire, acute, smooth on both sides; length about six inches. *Petioles* channelled, smooth, about an inch long. *Panicles* opposite, from the naked branches below the leaf-bearing shoots, ovate, brachiate, much longer than the leaves, smooth in every part. *Flowers* numerous, small, yellow. *Bractes* opposite, lanceolate. *Calyx* four-parted. *Corol* to the base four-cleft, consequently there is little or no tube, segments of the border lanceolate, with incurved margins. *Filaments* short and thick, inserted both on the base of the corol and the receptacle. *Anthers* a polleniferous groove on each side of the short, thick filaments. *Style* scarcely any. *Stigma* four-lobed. *Drupe* oblong, one-celled. *Nut* oblong, striped, one-celled. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed.

2. C. *Zeylanica. Linn. sp. pl. ed. Willd.* 1. 47.

Leaves opposite, short-petioled, obovate, entire, smooth. *Racemes* axillary, often compound; *flowers* ternary. *Bractes* ovate.

Linociera *purpurea. Vahl. En. pl.* 1. 47.

I. 108

Said to be a native of Ceylon.

3. C. *dichotoma. R.*

Shrubby, dichotomous. *Leaves* cuneiform-lanceolar, recurved, entire. *Racemes* axillary; *pedicels* three-flowered.

Native place Coromandel. The Asiatic synonima are uncertain. Flowering time in the Botanic garden the month of March.

Trunk short; *bark* dark ash-coloured, with many, elevated, lighter coloured specks. *Branches* dichotomous throughout, very numerous; height of the shrubs in the Botanic garden, about seven feet in seven years. *Leaves* opposite, short-petioled, broad-cuneiform, lanceolar, entire, rather obtuse; surfaces smooth, texture hard; three inches long by one broad. *Racemes* axillary, solitary, scarcely half the length of the leaves. *Pedicels* sub-opposite, diverging, three-flowered. *Flowers* small, white, inodorous. *Calyx* four-parted; segments ovate, obtuse, villous. *Corol*, the segments can scarcely be said to be united at the base, except by the filaments, which are inserted on the bases of two, and in that manner form two pair of segments; they are nearly exact, taper a little, and have their margins much incurved. *Filaments* two, short. *Anthers* large, with bifid apex. *Germ* four-sided, ovate, two-celled, with two ovula in each attached to the middle of the partition. *Style* short. *Stigma* obscurely two-lobed. *Drupe* superior, oval, or short obovate, size of a black currant, succulent, when ripe purple, one-celled. *Nut* obovate, rather thin, and tender, marked with four ribs from the apex to the base, with four small, imperfect ones between, one-celled. *Seed* solitary, conform to the nut. *Integument* single, thin, and tender. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed. *Radicle* patelliform, superior.

SCHREBERA. R.

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Calyx bilabiate. *Corol* salver-shaped. *Capsule* superior, turbinate, two-celled, two-valved. *Seeds* several, membrane-winged.

S. swietenioides. R. Corom. pl. 2. *N.* 101. I. 109

Teling. Mucaadi.

Tam. Mogalinga marum.

A large timber tree, a native of vallies over the mountainous parts of the Raja-mundri Circar, Balaghata mountains, &c. Flowering time the beginning of the hot season.

Trunk erect. *Bark* scabrous. Branches numerous, spreading in every direction, so as to form a large beautiful shady head. *Leaves* nearly opposite, petioled, pinnate with an odd one, about a foot long. *Leaflets*, three or four pair, opposite, short-petioled, the lowermost largest, and obliquely-ovate, or cordate, while those towards the apex become narrower; all are entire, pointed, smooth on both sides, and about three or four inches long. *Petioles* round, smooth. *Stipules* none. *Panicles* terminal, thin, trichotomous. *Bractes* small, caducous. *Flowers* rather small, white and brown, variegated, very fragrant during the night. *Calyx* beneath, tubular, somewhat two-lipped; *lips* nearly equal, emarginate, sometimes there are two lateral toothlets, one on each side in the fissures which separate the lips. *Corol* one-petalled, salver-shaped. *Tube* cylindric, three times longer than the calyx. *Border* spreading, divided into five, six or seven cuneate, truncate segments. *Filaments* two, short, inserted below the middle of the tube. *Anthers* oblong, hid within the tube of the corol. *Germ* above, oval. *Style* a little longer than the tube. *Stigma* bifid. *Capsule* large, pear-shaped, size of a pullet's egg, scabrous, very hard, two-celled, two-valved, opening from the apex. *Seed* four in each cell, they are irregularly oval, and compressed, with a long membranaceous wing.

Obs. The wood of this tree is of a gray colour, very close-grained, heavy and durable. It is reckoned less subject to bend or warp than any other hereabouts; on which account it is employed by weavers in many parts of their looms, particularly the beam. It is also used for a great variety of other purposes. I.

I am inclined to think it would answer well for scales to mathematical instruments; it does not look so well as box, but its not being subject to warp may render it fitter, though not so handsome. 110

ERANTHEMUM. Linn. Flor. Zeyl. 15.

Calyx five-cleft. *Corol* hypocrateriform; *border* regular, or nearly so. *Filaments* four, two of them sterile. *Capsule* two-celled, two-valved, bursting with elasticity opposite to the partition.

1. E. *montanum. R.*

Shrubby, diffuse. *Leaves* oblong, acute. *Spikes* terminal. *Bractes* linear, hairy.

Justica montana. R. Corom. pl. 2. *N.* 176.

A small, straggling, jointed, under shrub; a native of the Circar mountains, flowers during the cool season.

Stems many, striated, jointed, smooth, leaning on the ground, and rooting at the joints, young shoots four-sided. *Leaves* opposite, petioled, oval and oblong, pointed, running down the petioles, from three to four inches long, and about two broad. *Spikes* many, terminal, erect, slender. *Peduncles* four-sided. *Bractes* exterior, opposite, decussate, linear, acute, hairy, one-flowered. *Bracteoles* two to each flower, pressing laterally the calyx, and like the exterior, but much smaller. *Flowers* opposite, solitary, decussate, very pale blue. *Calyx* five-parted; *segments* subulate. *Corol* with a very long, and very slender tube, border of five equal obovate truncate, pale blue segments. *Filaments* short. *Anthers* single, oblong, within the tube of the corol. *Style* length of the tube of the corol. *Stigma* unequally bifid, appearing just without the tube. *Capsule* linear-oblong, compressed, pointed, two-celled, two-valved, opening across the partition, with an elastic jerk. *Seeds* two in each, compressed. I.

2. E. *pulchellum. Andrew's Repos. vol.* ii. 88. 111

Shrubby, erect. *Leaves* ventricose-oblong. *Spikes* terminal, imbricated. *Bractes* ovate-oblong.

Justicia pulchella. Roxb. Corom. pl. 2. *No.* 177.

Justicia nervosa. Vahl. En. pl. 1. 164.

Beng. Kalla-Jati.

Hind. Gool-sham.

A most beautiful, stout, flowering shrub; a native of dry, uncultivated, shady places, over various parts of India, flowering time the cold season. It is generally in its full beauty in February.

Stems many, erect, and ascending or nearly so; two or three feet high. *Branches* many; *young shoots* four-sided, smooth. *Leaves* opposite, short-petioled, oblong, waved, pretty smooth; from six to nine inches long, and from three to four broad; they are of a much deeper and brighter green than in E. *montana*, which this resembles most. *Spikes* terminal, *Bractes* disposed as in the former, but larger, broader, ciliate, and much nearer to each other. *Flowers* disposed as in the former but large, and of a deep bright blue purple colour. *Capsule* and *seeds* as in E. *montana*.

3. E. *suffruticosum. R.*

Shrubby, erect. *Leaves* ovate-oblong, smooth. *Spikes* terminal; *bractes* wedge-shaped,

Page naked. *Stamens* within the tube.
Carey Ed. A native of the Andaman Islands, whence several plants were brought to the Botanic garden, by Colonel Kyd; and are now (March 1797) in blossom. It is a small shrub, and of slow growth.

Stem and branches sub-erect, jointed; the younger somewhat four-sided and a little hairy. *Leaves* opposite, short-petioled, oblong, and ovate-oblong, somewhat repand, smooth
I. on both sides. *Spikes* terminal, flowers opposite. *Bractes* three-fold, one-flowered, the ex-
112 terior large, wedge-shaped, and naked; the interior daggered. *Corol; tube* length of the exterior bractes. *Border* regularly five-parted, pale blue. *Stamens* two, abortive filaments issuing from the base of the two fertile ones. *Anthers* half hid in the tube of the corol.

4. E. *diantherum. R.*

Suffruticose, erect. *Leaves* broad-lanceolar, smooth. *Racemes* terminal, in axillary, pedunculed umbellets. *Corol* somewhat bilabiate. *Anthers* twin.

A small delicate, perennial plant, brought from the Moluccas in 1800, blossomed in the Botanic garden in September 1801.

Stem curved, simple; *branches* few in our small young plants. *Leaves* opposite, petioled, ovate-oblong, entire, obtuse, destitute of pubescence, somewhat bullate; about two or three inches long, by one broad. *Flowers* numerous, collected on small, long-pedunculed, axillary umbellets; and in opposite fascicles, or solitary on a long terminal, slender, erect raceme; small, white, with a slight tinge of red, and some minute red spots on the base of the middle divisions of the under lips. *Bractes*, a single, ensiform one, at the base of each peduncle, with one or two, still smaller, about the middle of each pedicel. *Calyx* divided almost to the base into five slender, acute divisions. *Corol; tube* long, slender, and curved. *Border* sub-bilabiate: *upper lip* erect, two-parted; *lower* three-cleft; all the five segments equal. *Filaments* four, short, in the mouth of the tube, two of them very minute, and abortive. *Anthers* erect, twin. *Capsule* with two, or four, somewhat scabrous flattened orbicular seeds.

Obs. Is nearly allied to my E. *racemosum*, but differs from it in having long, slender-peduncled fascicles of flowers in the axills of the leaves, as well as in having from one to three or more flowers on each of the lower opposite peduncles of the racemes, while in that there is only one; and lastly, in having the upper lip of the corol only two-parted, which in
I. that is three-cleft.
113 5. E. *racemosum. R.*

Suffruticose. *Leaves* oblong, ventricose. *Racemes* terminal; *corol* somewhat bilabiate, both lips three-parted.

A small, under shrub, of great beauty, brought into the Botanic garden from the Moluccas, in 1798; and blossomed in November, 1799.

Stem small, with a few, slender branches; height of the whole plant about two feet. *Leaves* opposite, petioled, oblong, ventricose, and running down on the petiole, entire, and pretty smooth; from two to three inches long, and broad in proportion. *Racemes* terminal, some of them long, and slender; others shorter. *Flowers* opposite, pedicelled, approximate, pretty large, colour a pale pink, or white, tinged with red. *Bractes* subulate, one at the base of each pedicel, and two on it. *Calyx; divisions* equal, and subulate. *Corol* infundibuliform; *border* somewhat bilabiate; both *lips* three-parted, the under one considerably larger. *Filaments* four, short, inserted within the mouth of the tube, two of them minute, and abortive. *Anthers* half erect.

6. E. *barlerioides. Roxb.*

Shrubby, erect. *Leaves* ovate-oblong, smooth. *Spikes* terminal. *Bractes* wedge-shaped, naked. *Stamens* within the long slender tube, adjoined to them are two abortive filaments.

A native of the Andaman Islands, from whence several plants were brought to the Botanic garden, by Colonel Kyd, which blossom in March. It is a small shrub, and of slow growth.

Stem and *branches* sub-erect, jointed, the younger somewhat four-sided, and a little hairy. *Leaves* opposite, short-petioled, oblong and ovate-oblong, somewhat repand, smooth on both sides. *Spikes* terminal; *flowers* opposite. *Bractes* three-fold, one-flowered, the exterior
I. large, wedge-shaped, and naked; the interior daggered. *Corol: tube* length of the exterior
114 bractes. *Border* regularly five-parted, pale blue. *Stamens*, two abortive filaments issuing from the base of the two fertile ones. *Anthers* half hid in the tube of the corol.

JUSTICIA. Schreb. gen. N. 35.

Corol one-petalled, irregular. *Capsule* superior, two-celled, two-valved, bursting with elasticity contrary to the partition.

SECT. I. *Anthers single.*

1. J. *Ecbolium. Linn. sp. pl. ed. Willd.* 1. 85.

Shrubby, erect. *Spikes* terminal, four-sided. *Bractes* oval, ciliate. *Corol* bilabiate, tube filiform; upper lip linear, reflexed, with bipartite apex. *Capsule* two-seeded.

Carim curini. *Rheed. Mal.* 2. *t.* 20.

Hind. Oodoo-Jati.

A native of our Indian forests. Flowers the greatest part of the year.

Stems several, woody, straight, round, smooth, jointed, and swelled above the joints; from two to four feet high. *Leaves* opposite, petioled, oval, tapering a little towards each

end, smooth, a little waved. *Spikes* terminal, four-sided, imbricated with four rows of large, oval, sharply serrated, waved, one-flowered bractes. *Flowers* a pale blue or azure colour. *Corol ; tube* very long and slender ; *upper lip* linear, reflexed, becoming revolute, apex bifid ; *under lip* very broad, three-parted. *Anthers* simple, linear, erect. *Stigma* perforated, ciliate. *Capsule* two-seeded. Page Carey Ed.

2. J. *thrysiflora. R.*

Shrubby, erect, smooth. *Leaves* lanceolar, drooping. *Racemes* terminal, flowers verticelled. *Corol* sub-bilabiate. *Capsule* clavate, ten or twelve-seeded.

This beautiful stately species is a native of the interior part of Bengal, and from thence was introduced by Dr. William Carey, into the Botanic garden, where it flowers in January and February, and the seeds are ripe in March and April. I. 115

Root ramous. *Stem* straight, woody. *Branches* nearly straight, general height from four to eight feet; woody parts round, and covered with smooth ash-coloured bark ; *young shoots* smooth, swelled at the insertion of the leaves, somewhat four-sided, and tinged with dull purple. *Leaves* opposite, short-petioled, drooping, lanceolar, entire, smooth on both sides, of a firm texture, the upper side deep green, the under side pale ; from four to eight inches long, and from one to two broad. *Racemes* terminal, often solitary, though sometimes two, or even three-fold, thyrsiform, shape of the flame of a candle, crowded with large orange-coloured flowers. *Pedicels* four-fold, verticelled, approximate, one-flowered, shorter than the divisions of the calyx. *Bractes* three-fold, subulate ; the inner two permanent, and inserted on the base of the pedicels ; the exterior single one larger and caducous, *Calyx* simple, five-cleft, to the base divisions equal, straight, subulate, half the length of the tube of the corol. *Corol* about an inch long. *Tube* incurved, compressed, laterally somewhat villous. *Border* bilabiate ; *upper lip* broad, projecting straight forward, deeply emarginate ; *under lip* of three, equal, deeply-divided, ovate, acute divisions. *Anthers* even with the upper lip of the corol, dark brown, oval, an opening on the under side for the discharge of the white pollen, and studded on the back. *Style* scarcely so long as the stamina. *Stigma* entire. *Capsule* linear-clavate, smooth. *Seeds* five or six in each cell.

Obs. This is one of the most beautiful species of *Justicia* I have yet met with in India, even when only in foliage. It grows readily from cuttings.

3. J. *vitellina. R.*

Shrubby, erect. *Leaves* broad-lanceolar, reflexed, smooth. *Racemes* terminal, cylindric; *flowers* opposite ; below fascicled, about the middle tern, and above single ; sub-ringent, with ample-campanulate throat. *Capsule* linear, few-seeded. I. 116

A native of the hilly parts of Chittagong, where it blossoms in February and March.

Stems scarcely any, but several, erect, stiff, short branches, with their ultimate tender divisions four-sided, the angles sharp, and rather rough ; whole height of full grown plants about three feet. *Leaves* opposite, short-petioled, reflexed, from oblong to lanceolar, entire and pretty smooth ; from two to four inches long, by from one to two broad. *Racemes* terminal, solitary, rigidly erect, cylindric ; from three to six inches long. *Rachis* four-angled. *Flowers* rather small, colour yellowish pink, on the lower part of the raceme in opposite fascicles, about its middle in threes on common very short peduncles and pedicels ; above single. *Bractes* to the single flowers, solitary ; to the lower, three. *Calyx* single, five parted ; divisions broad-subulate. *Corol* with the tube shorter than the calyx, and an ample-campanulate throat ; *border* sub-bilabiate ; *upper lip* projecting almost horizontally, bifid ; *lower lip* broad, and three-parted. *Filaments* much curved, hairy near the base. *Anthers* single, linear, lodged under the upper lip of the corol. *Germ* two celled, about four ovula in each. *Stigma* simple, obtuse. *Capsule* linear, smooth.

4. J. *alba. R.*

Shrubby, erect, smooth. *Leaves* opposite, ovate-lanceolate. *Spikes* terminal, and axillary. *Flowers* remote. *Corol* with filiform tube, and bilabiate border.

This very pretty plant, a native of the Great Andaman, was brought from thence to the Botanic garden, by Capt. Stokoe. Flowering time the beginning of the hot season.

Stem erect, round, smooth, while young swelled above the insertions of the leaves. *Leaves* opposite, short-petioled, oblong, waved, smooth, and shining on both sides. *Spikes* numerous, terminal, and axillary, spreading, with a considerable recurvature, longer than the leaves, round, and smooth. *Flowers* opposite, remote, pure white. *Bractes*, three small ones to each flower, shorter than the calyx. *Corol ; tube* long, straight, filiform ; *upper lip* of two, erect, wedge-shaped divisions united below the middle ; *under lip* three-parted ; *divisions* broader and pointing downwards. *Filaments* short. *Anthers* just without the tube. I. 117

5. J. *picta. Linn. sp. pl. ed. Willd.* 1. 88.

Shrubby, erect. *Leaves* broad-lanceolate, pointed. *Racemes* sub-globular. *Tube* of the corol widening, vertically compressed, margins of the segments of the border revolute.

Tsjude maram. *Rheed. Mal.* 6. *p.* 111. *t.* 60.

Folium bracteatum. *Rumph. Amb.* 4. *p.* 73. *t.* 30.

A large, elegant, ramous shrub, common in gardens, and one of our finest ornaments. I never saw it wild ; it is in flower most part of the year.

Leaves opposite, short-petioled, ovate-lanceolate, smooth-pointed, generally variegated with large white spots, though sometimes of a uniform green, and we have a variety with the leaves uniformly ferruginous. *Racemes* terminal, short, erect, smooth. *Flowers* large, generally of a beautiful crimson colour. *Bractes* opposite ; below three or four-flowered ; above one-flowered. *Corol*, throat compressed, divisions of the border soon after they expand becoming spirally revolute, with their inside wrinkled, and beautifully ornamented with small

Page Carey Ed. chrystalline specks.

6. J. *paniculata. Linn. sp. pl. ed. Willd.* 1. 89.

Herbaceous, erect, four-sided, brachiate. *Leaves* sub-sessile, lanceolate. *Racemes* terminal; *flowers* secund, erect. *Corol* bilabiate; *lips* linear, revolute. *Anthers* coalesced, and bearded at the base. *Capsules* linear, many-seeded.

Beng. Kala-megh, Kalap-nath, or Muha-*tita*; the last name implies *King of bitters,*
I. and a very powerful, much esteemed one it is.
118 *Kreat* is the name by which it is known on the Malabar coast, &c. where it is much used in medicine, and is the bitter of the famous Nortrum, called *Drogue amere.*

Cara-canirum. *Rheed. Mal.* 9. *p.* 109. *t.* 5. 6.

Teling. Nella-vemgoo.

A native of dry ground, under the shade of trees, bushes, &c. Flowering and seed time, the wet and cold seasons.

Stem erect, generally annual, at least down to the root, branchy; slender, four-sided, jointed, smooth, one to two feet high. *Branches* opposite, cross-armed, four-sided, spreading. *Leaves* opposite, short-petioled, lanceolate, entire, smooth; two or three inches long. *Racemes* terminal, and from the exterior axills, horizontal, long secund, four-sided. *Flowers* remote, rose-coloured, long-pedicelled, alternate, erect, downy. *Bractes* a large, exterior opposite pair; within the flower-bearing one there are two smaller, embracing the base of the pedicels. *Corol* bilabiate. *Tube* recurved; *lips* linear, and reflected; the *superior* broadest, three-toothed; the *inferior* two-toothed. *Filaments* as long as the lips of the corol, projecting, hairy. *Anthers* very flat, obovate, firmly united at the base, and three-bearded. *Capsule* erect, sub-cylindric. *Seeds* three or four in each cell, cylindric.

7. J. *echioides. Linn. sp. pl. ed. Willd.* 1. *p.* 87.

Annual, erect, four-sided, hairy. *Leaves* sessile, decussate, oblong and linear. *Spikes* axillary, recurved over the bosoms of the leaves, secund. *Capsule* oblong, with four, verrucose seeds.

Pee-tumba. *Rheed. Mal.* 9. *t.* 46.

A native of Coromandel, and generally found on old walls, in flower all the year.

Stem annual, erect, four-sided, hairy, with ascending, opposite, similar, branches from the base; whole height about a foot. *Leaves* opposite, decussate, sessile, from oblong to linear,
I. obtuse, recurved, hairy; from one to two inches long. *Spikes* axillary, spreading out over
119 the bosom of the leaves, and in general shorter than them; in luxuriant plants compound. *Bractes* opposite, small, lanceolate, hairy. *Flowers* alternate, sessile, erect; *upper lip* purple, the rest white. *Calyx* of five, long, hairy, ensiform divisions. *Corol* bilabiate. *Tube* subcylindric; *upper lip* erect, broad, and trifid; *under lip* narrower, recurved, and bidentate. *Filaments* projecting, straight, and about as long as the lips of the corol. *Anthers* simple, united and bearded at the base. *Capsule* oblong, erect, hairy, length of the calyx. *Seeds* generally two in each cell, oblong, rough.

8. J. *polysperma. R.*

Annual, creeping, round, jointed. *Leaves* sessile, lanceolate, downy. *Spikes* imbricated. *Bractes* three-fold, one-flowered, woolly. *Capsule* with from twenty to thirty seeds.

Beng. Chhota-micheta.

It is a native of Bengal, and appears during the cold season amongst grass, &c. in uncultivated places.

Stems diffuse, or creeping, very ramous, six to twelve inches long, round, jointed, a little downy. *Leaves* opposite, sessile, lanceolate, entire, downy. *Spikes* terminal, and axillary, imbricated with opposite, decussated, flowers, and bractes. *Flowers* small, pale blue. *Bractes* three-fold, one-flowered, the lower one a little broader than the two lateral, all are woolly. *Calyx* woolly. *Capsules* linear, containing from twenty to thirty, small roundish seeds.

9. J. *acaulis. Linn. sp. pl. ed. Willd.* 1. 84. *R. Corom. pl.* 2. *N.* 127.

Root perennial, stemless. *Leaves* radical, sessile, ovate-oblong, crenate. *Spikes* ascending, imbricated. *Corol* ringent. *Capsules* many-seeded.

Elytraria *crenata. Vahl. Enum. plant.* 1. 106.

Teling. Nella mura.

Grows on pasture ground, generally under the shade of trees. Flowering and seed time
I. the wet and cold seasons.
120 *Root* perennial. *Stem* none. *Leaves* radical, spreading close on the ground, sessile, wedge-form or oblong, crenulated, rugose, woolly on the under side; from six to twelve inches long. *Spikes* radical, several, as long as, or longer than the leaves, ascending, imbricated from top to bottom, with small, rigid, pointed bractes, each of the superior ones embracing a flower, and two small lateral bractes. *Flowers* small, white. *Calyx* five-leaved, the superior leaflets much the largest. *Corol; tube* cylindric, recurved; *upper lip* vaulted, *under lip* broad, three-parted, with the divisions two-parted. *Capsules* conical, eight-seeded. *Seeds* kidney-form.

SECT. II. *Corols bilabiate. Anthers double.*

10. J. *nasuta. Vahl. Symb.* 2. 15. *Linn. sp. pl. ed. Willd.* 1. 90.

Shrubby, erect. *Leaves* short-petioled, lanceolate. *Panicle* axillary and terminal. *Upper lip* of the corol, linear and bidentate; *under lip* broad, three-lobed.

Pul-colli. *Rheed. Mal.* 9. 135. *t.* 69.

Sans. Yoothika-*purnee.*

Beng. Jooi-pana.
Teling. and *Tamul.* Naga-mulli.

Page Carey Ed.

This species I have only found in gardens: from whence it originally came, I cannot say. Flowers all the year round, but never ripens its seed, owing I imagine, to its being always propagated by cuttings, layers, or slips. It grows to be a large thin shrub, of five or more feet in height.

Root woody, ramous. *Stems* many, erect, ramous, the old woody parts round, and covered with pretty smooth ash-coloured bark; the tender branches, and young shoots jointed, smooth, and obsoletely six-seeded. *Leaves* opposite, petioled, broad-lanceolate, point obtuse, above smooth, below a little downy, entire; from two to four inches long, and from one to two broad. *Panicles* corymbiform, axillary, and terminal, always three-cleft, as also the subdivisions. *Peduncles* and *pedicels* short, round, a little downy. *Bractes* minute. *Flowers* small, white. *Corol* with a long, slender, compressed tube; *under lip* broad, three-cleft; *upper lip* erect, linear, sides reflected, apex bifid. *Nectary*, a fleshy ring surrounding the base of the germ. *Anthers* without the tube, twin. *Capsule;* I have not seen it. I. 121

Obs. Milk boiled on the roots, is reckoned, by the Indian physicians aphrodisiacal, and as such often employed; for no medicines are more sought after by the natives of India than those which are imagined to belong to that class.

The roots rubbed with lime juice, and pepper, are used, and often with good effect, to cure the *ring worms*, or Herpes miliaris, which in India is a most troublesome disease, and very common.

They are also used for the bite of poisonous snakes; hence the *Telinga* and *Tamul* name *Naga mulli*, or Jasmine of the *Cobra de capella; Naga* is therefore prefixed to the name of the most of their antidotes, or medicines supposed to destroy the effect of poison, and occurs very often in their writings. For like the ancient physicians of Greece, Rome, &c. those of India at this day, make poisons, and their antidotes a very chief part of their studies; but from the seeming inactivity of a very large share of them, we may safely conclude, that their practice is equally frivolous with that of the ancients, and ought to be discouraged as much as possible; because at least, they prevent the application of more efficacious remedies.

11. J. *lanceolaria. R.*

Shrubby, erect. *Leaves* petioled, lanceolar, smooth. *Fascicles* terminal, panicled, clammy, from two to four-flowered, embraced by many, long, ensiform, bractes. *Tube* of the corol curved, and twisted; *upper lip* three-dentate; *under lip* entire. I. 122

This beautiful shrub is a native of the Silhet district, where it is called *Toogee.* Flowering time, the cold season.

Stem erect, or nearly so; *branches* round and smooth, and while young, swelled just above the insertion of the leaves; whole height from two to four feet. *Leaves* opposite, petioled, lanceolar, (that is tapering equally at each end) entire, acute, smooth; from three to six inches long, and one or two broad. *Flowers* numerous, large and rosy, collected in numerous terminal, clammy, fascicles of from two to four each, and embraced by numerous, ensiform, clammy bractes, like a common calyx, and longer than the proper perianths; the whole forming a pretty large panicle at the end of each branch. *Calyx* five-parted; *segments* ensiform, smooth. *Corol; tube* long, slender, curved outward, and like my J. *speciosa, latebrosa,* &c. has a half twist; which, as in the *orchideæ*, brings the lower lip uppermost. *Border* bilabiate, *lips* nearly equal, oblong; the *superior*, in its inverted state, three-toothed; *inferior* entire. *Filaments* from the mouth of the tube of the corol, shorter than the lips, and projecting straight over the under one. *Anthers* double, one at the end of the other, forming one straight line; the exterior half of the posterior one being attached to the apex of the filaments, and to the base of the exterior anther.

12. J. *speciosa. R.*

Perennial, erect. *Leaves* ovate-cordate. *Peduncles* axillary and terminal, proliferous, few-flowered. *Bractes* opposite, foliaceous. *Corol* bilabiate, tube curved, and twisted; *lips* equal; upper one tridentate, lower one bidentate.

A native of the interior parts of Bengal, where it blossoms during the cold season, and is then one of the greatest ornaments of the forests.

Stems erect, jointed. *Branches* few, and erect. *Bark* of the lignous parts ash-coloured; of the young shoots smooth and green. *Leaves* opposite, decussate, petioled, ovate-cordate, entire, rather obtuse, a little wrinkled; from one to four inches long. *Peduncles* axillary, often proliferous and much longer than the petioles, supporting two, or three flowers. *Flowers* large, beautiful, bright carmine colour. *Bractes* or floral leaves opposite, sessile, from ovate to linear. *Calyx* simple, divided almost to the base into five ensiform, equal portions. *Corol; tube* long, slender, curved, villous, and somewhat twisted; *upper lip* linear-oblong, recurved over the tube, apex three-toothed, at the base some dark coloured spots; *under lip* broad-lanceolate, pointing directly to the earth, apex slightly two-toothed. *Filaments* inserted in the mouth of the tube of the corol, nearly as long as its border, and, with the lower lip, pointing downwards. *Anthers* double, linear, purple, with pale coloured pollen. *Style* as long as the stamens, and beyond the tube taking the same direction with them. *Stigma* slightly emarginate. *Capsules* pedicelled, with two seeds in each cell. I. 123

13. J. *tinctoria. R.*

Shrubby. *Leaves* petioled, ovate-oblong. *Flowers* terminal, fascicled, involucred. *Anthers* linear.

Folium tinctorium. Rumph. Amb. vi. 51. *tab.* xxii. *f.* 1.
Beng. Batia-rung.

Page Carey Ed.

Found in the woods about Calcutta, in full flower in October.

Stem scarcely any; *branches* numerous, sub-erect; *young shoots* jointed, and swelled above the joints, round, a little downy. *Leaves* opposite, petioled, oblong, entire, covered with a little harsh pubescence, two to three inches long. *Peduncles* terminal, forming the exterior axills, each supporting some few fascicles, of four to six sessile flowers. *Bractes* opposite, sessile, entire; those of the flowers (better perhaps called involucels) linear, oblong, cordate, unequal: the uppermost being larger and incumbent over the fascicle of flowers. *Calycine*
I. bractes small. *Calyx* five-toothed. *Corol; tube*, length of the largest involucres, filiform,
124 having a small twist near the apex. *Border* two-parted, both divisions oblong, the upper one three-toothed. *Nectary* a gaping cup in which the germ rests. *Stamens* projecting. *Anthers* two on each filament. *Style* rather longer than the stamens. *Stigma* obtuse.

14. J. *bivalvis. Linn. sp. pl. ed. Willd.* 1. 82.

Shrubby. *Leaves* lanceolate. *Peduncles* axillary, and terminal, three to six-cleft; lateral pedicels often trifid; ultimate divisions bearing a small head of sessile flowers, between two, unequal, linear bractes. *Capsule* clavate.

A native of the Moluccas.

Folium tinctorium of Rumphius, quoted under the preceding species, does not so well agree with J. *bivalvis.* I think *Adel-Odagam, Rheed. Mal.* ix. 81. *t.* 43. belongs to neither of them.

15. J. *chinensis. Vahl. en. pl.* 1. 110.

Perennial, retroflex. *Leaves* cordate. *Umbellets* axillary, from three to five, and with the pedicels (from three to five), distichous, involucels obovate, unequal. *Capsules* round and thin.

J. *chinensis. Linn. sp. pl. ed. Willd.* 1. 80. *Burm. ind.* 8. *t.* 4. *f.* 1. is bad if intended for this plant.

A middle-sized, straggling, suffruticose species introduced from China into the Botanic garden, where it flowers from August till December.

Stem scarcely any; *branches* several, scarcely ligneous, straggling and ascending, slender, somewhat six-angular, pretty smooth; striking root where they rest on the ground; from one to two feet long. *Leaves* opposite, petioled, ovate cordate, entire, somewhat acuminate, smooth, from one to two inches long. *Peduncles* axillary, from three to five in each axill, dis-
I. tichous; of various length, each supporting a little, distichous umbellet of from three to five,
125 one or two-flowered short pedicels. *Involucres* of the pedicels two, subulate, opposite, of the flowers two, sessile, unequal, obovate, or oblong-ventricose, embracing between them one or two complete flowers, and one or two rudiments. *Bractes* (or inner calyx), ensiform, two to each flower, and rudiment. *Flowers* small, pale-pink. *Calyx* five-parted, segments ensiform. *Corol; tube*, length of the involucres, a little twisted. *Border* bilabiate; *upper lip* linear, three-toothed; *under lip* oval, and slightly emarginate. *Anthers* two on each filament, purple. *Capsule* pedicelled, small, flat, round, villous, two-celled, with two thin round seeds in each cell.

Obs. I have two varieties (if not distinct species) from the coast of Coromandel. In the first, the leaves are much narrower, and run more down on the petioles, and, with the bractes of the flowers, longer, more cuspidate, and ciliate. In the second variety, the leaves are cuneiform-lanceolate, and the bractes of the flower broad-ovate, short cuspidate, and hairy.

16. J. *latebrosa. Kön. MSS.*

Herbaceous; *branches* straggling, round, smooth. *Leaves* petioled, cordate-oblong, pointed. *Tube* of the corol twisted; *lips* almost equal; the upper one three dentate, the lower one bidentate. *Seeds* solitary.

It grows always among bushes, or under their shade, in a dry barren soil. Flowering time, the wet and cold seasons.

Root perennial. *Stem* scarcely any; *branches* many, straggling, weak, round, smooth, jointed, ramous. *Leaves* opposite, petioled, cordate-oblong, pointed, entire, smooth; size very various. *Flowers* terminal, large, of a bright, red colour. *Bractes* numerous, lanceolate. *Calyx* single. *Corol; tube* twisted at the middle; *lips* equal, linear; the upper one three-toothed, and the under one emarginate. *Stamens* as long as the lips of the corol, projecting along the under lip. *Anthers* double. *Stigma* two-cleft. *Capsules* two-seeded, one in each
I. cell.
126 17. J. *bicalyculata. Linn. sp. pl. ed. Willd.* 1. 81.

Annual, erect, six-sided, scabrous. *Leaves* short-petioled, ovate-cordate, oblong, pointed, *calyx* double; *tube* of the corol twisted, border bilabiate, seeds solitary.

Dianthera malabarica. Suppl. 85.

J. *malabarica. Ait. Hort. Kew.* 1. 27.

J. ligulata. *Lam. illustr.* 1. 40. *t.* 12. *f.* 2. *Cavan. icon.* 1. 52. *t.* 71.

Beng. Nasa-bhaga.

Teling. Chebiera.

A poor looking plant, a native of rubbish, road sides, and hedges. Flowering time the wet and cold seasons.

Stem erect, annual, ramous, six-angled, jointed, scabrous, and hairy, from three to five feet high. *Leaves* opposite, petioled, ovate-cordate, hairy, somewhat scabrous, size very various. *Flowers* terminal, and axillary, numerous, red, generally three-fold, or rather sub-panicled, and divided by threes. *Bractes* small. *Calyx** double, or rather some *bractes* embracing the

* The outer calyx may be called common, for there are always rudiments or buds of more than one flower in it, which often expand in succession.

proper perianth. *Tube* of the corol with a half twist about the middle; *upper lip* narrowest, linear, three-toothed; *lower lip* broad, oblong, emarginate. *Filaments* shorter than the corol, projecting along the under lip. *Anthers* red, two on each filament. *Capsules* four-seeded, two in each cell. Page Carey Ed.

SECT. III. *Corols ringent. Anthers double.*

18. J. *Adhatoda. Willd.* 1. 96.

Sub-arboreous. *Leaves* broad-lanceolar. *Spikes* short, long-peduncled; exterior bractes ovate, permanent. *Corol* ringent, upper lip vaulted, and emarginate.

Sans. Vidyumatri, Singhee, Vasika, Vrishu, Uturoosha, Singhashya, Vasooka, Vajidantuka.

Hind. and *Beng.* Bakus, Vasooka. I.

This small tree or large shrub, is common over most parts of India. Flowering time the cold season. 127

Trunk straight, bark pretty smooth, ash-coloured. *Branches* sub-erect, with bark like that of the trunk, but smoother. *Leaves* opposite, short-petioled, broad-lanceolar, long, taper-pointed, smooth on both sides, about five or six inches long, and one and a half broad. *Spikes* from the exterior axills, solitary, long-peduncled, the whole end of the branchlet forming a leafy panicle, flower-bearing portion short, and covered with large bractes. *Flowers* opposite, large, with small ferruginous dots; the lower part of both lips streaked with purple. *Bractes* three-fold, opposite, one-flowered. *Exterior* one of the three, large, ovate, obscurely five-nerved. *Interior* pair, much smaller, end sub-lanceolate; all are permanent. *Calyx* five-parted to the base; *divisions* nearly equal. *Corol* ringent. *Tube* short; *throat* ample; *upper lip* vaulted, emarginate; *lower lip* broad, and deeply three-parted; both streaked with purple. *Filaments* long, resting under the vault of the upper lip. *Anthers* twin.

Obs. The wood is soft, and esteemed very fit for making charcoal for gun-powder.

19. J. *decusata. R.*

Shrubby, erect; *branches* twiggy, villous, and decussated. *Leaves* from ovate to oblong. *Flowers* in opposite fasciculi on the leafless branchlets. *Anthers* double, all calcarate.

A tall, stout shrubby plant, a native of the country above Rangoon; and from thence introduced into the Botanic garden, where it is in flower during the month of February and March.

Stem straight to the plant, ligneous; in two years' old plants as thick as a walking cane. *Branches* regularly decussate, straight, all the younger shoots villous, and as they shoot into flower nearly leafless. *Leaves* short-petioled, ovate-oblong, entire, pretty smooth; from three to twelve inches long. *Flowers* in numerous little, opposite fascicles, of three to six, appearing sub-verticelled, over the slender, leafless twigs, sub-sessile, pale rose colour. *Bractes* numerous, slender, and very downy. *Calyx* five-parted; *segments* ensiform, villous. *Corol* ringent; *tube* gibbous near the base; *upper lip* sub-lanceolate, concave, erect; *under lip* broad and three-lobed. *Filaments* nearly as long as the upper lip; *apex* much enlarged. *Anthers* two on each filament, all with a calcarate base. *Germ* oblong, sitting in a large, glandular, yellow ring. *Style* the length of the stamens. *Stigma* simple. I. 128

20. J. *Gendarussa.* Linn. sp. pl. ed. Willd.* 1. 87.

Shrubby, diffuse, smooth. *Leaves* narrow-lanceolar. *Spikes* terminal, sub-verticelled. *Lower* authers calcarate.

Vada-Kodi. *Rheed. Mal.* 9. *p.* 79. *t.* 42.

Gendarussa. *Rumph. Amb.* 4. *p.* 70. *t.* 28.

Beng. Jugut-mudun.

A handsome shrub. I have never met with it wild, but in gardens it is common, and grows readily from slips and cuttings; it is in flower during the wet seasons chiefly. I am told it is indigenous on the Malay Islands.

Stem scarcely any. *Branches* numerous, long, straggling, except when kept cut, they are then more erect. *Bark* of the young parts generally dark purple, and very smooth; in some varieties green. *Leaves* opposite, short-petioled, lanceolar, obtuse, frequently a little scolloped, smooth; nerve and veins dark purple, from three to six inches long, and from half an inch to an inch broad. *Spikes* terminal, erect, verticelled. *Anthers* double, the lower ones have a spur-like process projecting downwards and outwards.

21. J. *Betonica. Linn. sp. pl. ed. Willd.* 1. 96.

Shrubby. *Leaves* sub-ovate. *Spikes* terminal. *Bractes* white, with green veins. *Corol* ringent. *Anthers* two-lobed, the lower calcarate. *Seeds* turbercled, two in each cell. I. 129

Bem-Curini. Rheed. Mal. 2. *p.* 33. *t.* 21.

A perennial species; a native of Coromandel. Flowering time the dry season chiefly, though it is more or less in blossom all the year, particularly when in a cultivated state.

Stems several, while young, erect by age, leaning in various directions, round, smooth, swelled above the joints, the height of the whole plant from two to four feet. *Leaves* opposite, petioled, nearly ovate, entire, or slightly waved, smooth on both sides; from one to six inches long. *Spikes* terminal, secund, sub-cylindric, erect. *Bractes* of the rachis opposite, ovate-oblong, villous, white with green veins, the posterior one always abortive; those of the flowers opposite and resembling those of the rachis, but narrower. *Flowers* pretty large,

* Willdenow has spelled this name Linnæus wrote it Gandarussa, which is nearer the truth. The word is *Gandharasa.*

Page Carey Ed. whitish, with rose-coloured veins. *Calyx* single, five-cleft; divisions ensiform. *Corol* ringent; upper lip vaulted and two-toothed; lower three-parted. *Anthers* twin, the lower one with a spur from the lower end. *Capsule* longer than the calyx, villous. *Seeds* two in each cell, tending to be round, rough with numerous sharp points.

22. J. *ramosissima. R.*

Shrubby, creeping, very ramous. *Leaves* sub-ovate. *Spikes* terminal, secund. *Bractes* lanceolate. *Lower* lobe of the anthers calcarate.

A native of Coromandel. Flowering time, in the Botanic graden, the cold season.

Stem none, *branches* numerous, rising in every direction, as well as spreading on the ground, and striking root at the swelled joints; the tender parts striated, and slightly villous. *Leaves* opposite, petioled, sub-ovate, rather obtuse, tapering down the petioles nearly to their base. *Spikes* terminal, secund, erect, many times longer than the leaves. *Bractes* in opposite pairs, lanceolate, coloured green and white; the posterior one of the rachis always abortive, the other two are calycine. *Flowers* scarcely longer than the bractes, dull white, with a few I. 130 rosy veins on the centre of the lower lip. *Calyx* of five linear-lanceolate, acute segments. *Corol* ringent; *upper lip* vaulted, with a bidentate apex; *under lip* broad, and three-cleft. *Anthers* double; lower lobe with a long curved, sharp spur. *Capsule* oblong, four-seeded, very protuberant at the seeds. *Seeds* nearly spherical, rugose.

Obs. In the foliage, spikes, flowers, and capsule, this species is exceedingly like J. *Betonica*, which however, is always a tall, erect plant, with coloured bractes, while this is very bushy, spreads on the ground, and strikes root abundantly at the joints; the bractes also are narrower, and greener.

23. J. *tranquebariensis. Linn. sp. pl. ed. Willd.* 1. 99.

Herbaceous. *Leaves* round, or broad-cordate. *Spikes* terminal, four-sided, occasioned by four rows of roundish ciliate bractes. *Flowers* solitary, in two rows on the fore-part of the spikes. *Anthers* calcarate. Common amongst bushes on a dry barren soil, over the coast of Coromandel. Flowering time the wet and cold seasons.

Roots perennial, somewhat granulated. *Stems* in young plants erect, in old ones uncertain; *branches* annual, small, straggling, round, a little downy, jointed, and swelled above the joints, from one to two feet long. *Leaves* opposite, short-petioled, oval, or round, entire, pretty smooth. *Spikes* terminal, peduncled, long, erect, generally four-sided, occasioned by four rows of orbicular, short-petioled, opposite, ciliate bractes; besides these there are a pair of small pointed ones which press the calyx laterally. *Flowers* a mixture of pale yellow, and red; standing in the axills of the two rows of bractes that occupy the fore-part of the spikes; on the back part they are generally wanting. *Calyx* single. *Corol; upper lip* emarginate, erect; *under lip* broad, three-cleft. *Anthers* double, the lowermost calcarate. *Seeds* two in each cell, bristly.

I. 24. J. *glabra. Kön. MSS.*
131 Herbaceous, erect, branchy, round, smooth. *Leaves* petioled, ovate, pointed. *Peduncles* trichotomous. *Upper lip* of the corol vaulted. *Lower anthers* calcarate. *Capsules* four-seeded.

A native of similar places with the last described. Flowering time the same.

Root perennial. *Stems* several, erect, branchy, annual, round, smooth, jointed. *Leaves* opposite, oblong-cordate, pointed, entire, smooth. *Panicles* axillary, small, three-forked. *Flowers* rose-coloured, yellow, and whitish green mixed. *Bractes* small, pointed; generally two below every division of the panicle, and two or three pressing upon the calyx. *Calyx* single. *Corol; tube* short, widening; *upper lip* erect, vaulted; *under lip* broad, and three-parted. *Filaments* concealed under the upper lip. *Anthers* double, the lower ones calcarate. *Stigma* slightly bifid. *Capsule* four-sided, two seeds in each cell.

25. J. *tomentosa. R.*

Herbaceous, sub-erect, hairy. *Leaves* lanceolar, tomentose. *Spikes* terminal, strobiliform. *Anthers* distinct. *Capsules* conic, four-seeded.

A native of wet, rich, pasture ground. Flowering time the wet and cold seasons.

Root nearly spindle-formed, perennial. *Stems* several, sub-erect, round, hairy, from one to two feet high. *Leaves* opposite, petioled, broad-lanceolar, entire, very downy; the lower many times larger than the upper ones, the former being often twelve inches long, and the latter (or floral *leaves*) not more than one. *Spikes* terminal, oval, strobiliform, sessile on little terminal branchlets. *Flowers* small, bright, bluish purple. *Bractes* numerous, imbricated, oval, pointed, concave, hairy, one-flowered. *Calyx* four-cleft; the lower leaflet two-cleft. *Co-* I. *rol; tube* gibbous on the under side, contracted at the mouth; *upper lip* ovate, half two-cleft, 132 divisions pointed; *under lip* very broad, three-parted. *Anthers* twin, equal, oval. *Stigma* two-cleft; *segments* broad. *Capsules* pointed, eight-seeded.

26. J. *orixensis. Kön. MSS.*

Herbaceous. *Branches* straggling, four-sided. *Leaves* cordate, repand. *Spikes* terminal. *Bractes* orbicular, ciliate. *Capsules* length of the bractes, containing about four echinate seeds.

Obs. It is a native of high, dry, gravelly ground, in the vicinity of Samulcota. Is very like J. *tranquebariensis.*

27. J. *repens. Linn. sp. pl. ed. Willd.* 96. *Corom. pl.* 2. *No.* 152.

Herbaceous, diffuse. *Leaves* sub-sessile, lanceolate. *Spikes* axillary and terminal, compressed. *Bractes* ovate, white, membrane-bordered, posterior rows neuter. *Lower anthers* crescent-shaped.

Adhadota. spicata flosculos ex foliolis membranaceis producens. *Burm. zeyl.* 7. *t.* 3. *f.* 2.

A native of pasture ground. Flowering time the wet and cold seasons. Page Carey Ed.

Root perennial. *Stems* many, diffuse, round, jointed, smooth, sometimes rooting at the joints; one to two feet long. *Leaves* opposite, short-petioled, broad-lanceolate, entire, sharp-pointed, smooth. *Spikes* axillary, peduncled, erect, somewhat compressed, secund. *Bractes; exterior,* four rows, oval, with a broad, white, membranaceous margin; the two rows on the back of the spike neuter; the two on the fore-part embracing the flowers; the calyx of each flower is also embraced laterally by two smaller lanceolate bractes. *Flowers* alternate, pale rose-coloured. *Corol, stamens, pistil* and *capsule* as in J. *procumbens,* which it much resembles.

28. J. *procumbens. Linn. sp. pl. ed. Willd.* 1. 87.

Root perennial; *branches* diffuse, herbaceous. *Leaves* sessile, from orbicular to linear-lanceolate. *Spikes* terminal, four-sided. *Bractes* lanceolate, rigid. *Lower anthers* calcarate. I. 133

Euphrasia, Alsines angustiore folio, &c. *Pluk. Alm.* 142. *t.* 56. *f.* 3.

Very common on pasture ground over the coast of Coromandel; flowering most part of the year.

Root often perennial. *Stems* many, spreading, jointed, five-striated, often rooting at the joints, extremities sub-erect: size very various, but generally from six to twelve inches long. *Leaves* opposite, sub-sessile, from round to linear-lanceolate, entire, a little downy; size various. *Spikes* terminal, erect, four-sided. *Flowers* opposite, decussate, small, rose colour. *Bractes* three-fold, lanceolate. *Calyx;* upper divisions very minute. *Corol; tube* short; *upper lip* erect, two-cleft; *under lip* broad, three-parted. *Nectary* a yellow ring surrounding the base of the germ. *Anthers* double; the lower calcarate or sharp-pointed. *Stigma* slightly bifid. *Capsules* four-seeded, two in each cell.

Obs. When this plant grows in wet places, it seems altogether another species, being many times larger, nearly erect, with linear-lanceolate leaves. I believe Dr. König described this variety as a distinct species, under the name of J. *juncea,* or *graminea.*

29. J. *quinqueangularis. Kön. MSS.*

Perennial in a dry soil; *branches* five-sided. *Leaves* sessile, lanceolate. *Spikes* terminal. *Bractes* linear. *Capsules* rather larger than the bractes, four-seeded.

A native of the borders of rice-fields about Samulcota. It is but little removed from *procumbens,* when growing in the same soil.

30. J. *pectinata. Corom. pl.* 2. *N.* 153.

Herbaceous, diffuse. *Leaves* short-petioled, lanceolar. *Spikes* sessile, secund. *Bractes* five-fold, broad, white, membrane-bordered; *lower anthers* calcarate. I. 134

Compare with J. *parviflora. Retz. Obs.* 5. *p.* 9.

A very beautiful, delicate, diffuse species, growing in shady places. Flowering time the cold season.

Stems many, diffuse, filiform, round, smooth, jointed. *Branches* alternate. *Leaves* opposite, short-petioled, depending, lanceolate, entire, smooth; the pair are generally unequal in size. *Spikes* axillary or terminal, sessile, much shorter than the leaves, secund, generally three together, the middle one largest. *Flowers* very small, bright blue. *Bractes,* to each flower five, of different sizes, oval or lanceolate, with beautiful white, membranaceous margins. *Corol;* upper lip entire, acute. *Anthers,* the lower one of each filament has a long obtuse horn from the under end. *Capsules* four-seeded, two in each cell.

31. J. *lamifolia. Kön. MSS.*

Whole plant very downy, procumbent, annual. *Leaves* oval. *Spikes* terminal, imbricated. *Calyx* four-leaved.

Found in the vicinity of Calcutta, in uncultivated shady places.

Root fibrous. *Stems* and *branches* very numerous, round, spreading close on the earth, clothed with long soft hair, and down, somewhat glutinous, length from one to three feet. *Leaves* opposite, sub-sessile, oval, entire, clothed and glutinous like the branches; about an inch long. *Spikes* terminal, oblong, closely imbricated with the bractes, and flowers. *Flowers* numerous, small, variegated with deep and light purple. *Bractes* ovate, one-flowered, hairy, clammy. *Calyx* four-leaved, the under leaflet with its apex bifid. *Corol* ringent. *Tube* gibbous; throat compressed; *upper lip* two-parted, and streaked with deep purple; *under lip* broad, and three-parted. *Filaments* short, inserted into the mouth of the tube. *Anthers* twin, singly oval, and all equal. *Stigma* of two, broadish, spreading lobes. *Capsule* conical. *Seeds* eight or ten, roundish. I. 135

Obs. It has the calyx of a *Barleria* and the stamina of a *Dianthera.* Mr. R. Brown informs me that he thought it would belong to a new genus, which he calls *Nelsonia.*

32. J. *verticillata. R.*

Erect, hairy, spines verticelled with their apices bifid, or trifid. *Leaves* petioled, ovate. *Flower* amongst the verticils of spines, sub-sessile.

Hind. Custoola.

Found by Dr. Hunter in the vicinity of Oujein, in seed and flower in March.

GRATIOLA. Schreb. gen. N. 37.

Corol one-petalled, irregular. *Sterile* filaments two, affixed to the lower lip of the corol. *Anthers* double, and connected. *Capsules* superior, two-celled, two-valved. *Seeds* numerous.

1. *G. amara. R.*

Annual (in Bengal), creeping. *Leaves* petioled, cordate, serrate. *Peduncles* axillary,

Page Carey Ed. four to six-flowered. *Calyx* four-leaved, exterior pair cordate, inner subulate, apices of the sterile filaments free. *Capsule* ovate, hid in the calyx.

Caranga amara. *Vahl. enum. vol.* 1. 100.

Serratula amara. *Rumph. Amb.* 5. *p.* 459. *t.* 170. *f.* 1. which has been quoted by mistake, I presume, for *Scutellaria indica.*

This pretty plant has been accidentally introduced into the Botanic garden, among spice and other plants from the Moluccas. Flowering time the cold season.

Root fibrous. *Stems* and *branches* creeping, with their extremities sub-erect, four-sided, coloured, smooth. *Leaves* opposite, petioled, cordate, deeply serrate, somewhat rugose, of a soft texture, but free of pubescence; in general about two inches long. *Peduncles* axillary, I. solitary, rather longer than the petioles, supporting at their extremities, two or three pairs, 136 of opposite pedicelled flowers. *Bractes* small, oblong, one under the insertion of each pedicel. *Calyx* of two pair of opposite leaflets; *exterior* pair large, cordate, often notched; the upper one larger, and incumbent over the rest of the calyx, and all the corol except the under lip; *inner* or lateral pair, linear-lanceolate, and much smaller than the exterior pair. *Corol* bilabiate; *tube* contracted at the middle; *upper lip* straight, narrow, with a two-lobed apex; *under lip* broad, three-lobed, drooping. *Stamina*, the fertile pair of filaments lodged under the upper lip of the corol with twin anthers, adhering by pairs, the sterile pair from the under lip, with large yellow, free, clavate apices. *Stigma* two-lobed. *Capsules* ovate, two-celled, hid between the exterior leaflets of the calyx. *Seed* numerous, very small.

Obs. As Rumphius observes, the leaves of this plant are exceedingly bitter, and might no doubt answer valuable purposes in medicine.

2. G. *grandiflora. Linn. sp. pl. ed. Willd.* 1. 105. *Corom. pl.* 2. *N.* 179.

Annual, creeping. *Leaves* sessile, broad-lanceolate, pointed, serrate. *Flowers* axillary, solitary. *Capsules* linear.

A native of moist places. Flowers during the wet and cold seasons.

Stems several, annual, creeping, four-sided, smooth; from six to twelve inches long. *Leaves* opposite, sessile, oblong, sharply-serrate, pointed, smooth. *Peduncles* axillary, about half the length of the leaves, erect, one-flowered. *Flowers* light blue. *Corol; tube* cylindric, *upper lip* entire; *under lip* broad, three-parted. *Stamens*, the two fertile filaments lodged under the upper lip, approaching archways. *Anthers* twin, united; the sterile filaments resting on the under lip and adhering to it, yellow, curved. *Capsules* lanceolate, longer than the I. calyx.

137 3. G. *alata. R.*

Annual. *Leaves* petioled, ovate, serrate-dentate. *Racemes* terminal. *Calyx* five-toothed, and five-winged. *Sterile* filament free. *Capsule* linear, hid in the calyx.

A native of the Moluccas, is one of the largerst of our Indian *Gratiolas*, and readily known by the five large membranaceous wings which run the whole length of the calyx.

4. G. *involucrata. R.*

Leaves unequally petioled, round-cordate, with large rounded lobes, many-nerved, serrulate, villous. *Flowers* collected into long peduncled, bracted heads. *Sterile* filaments free. *Capsule* hid in the villous, gibbous five-toothed calyx.

This species is also a native of the Moluccas.

5. G. *rotundifolia. Linn. sp. pl. ed. Willd.* 1. 103. *Cor. pl.* 3. *N.* 204.

Annual, erect. *Leaves* sessile, round-cordate, serrrate-dentate. *Peduncles* axillary, solitary, longer than the leaves. *Capsules* globular.

A native of moist places, appearing and flowering during the wet and cold seasons.

Stems erect, four-sided, from four to six inches high. *Leaves* opposite, sub-sessile, round-cordate, serrate, or notched, a little hairy. *Flowers* axillary, or between the leaves, white. *Peduncles* longer than the leaves. *Corol; stamens* and *stigma* as in the foregoing species. *Capsules* round, as high as the calyx.

6. G. *integrifolia. R.*

Annual, while young straight, afterwards straggling, four-sided. *Leaves* sessile, ovate, three-nerved, entire. *Peduncles* solitary, axillary, one-flowered. *Capsules* the length of the calyx.

I. Tsjanga-pupum. *Rheed. Mal.* 9. *t.* 57.

138 A native of Bengal, where it appears as a weed in gardens, during the rains.

7. G. *lucida. Linn. sp. pl. ed. Willd.* 1. 103. *Ind. pl.* 3. *N.* 202.

Annual, spreading, four-sided. *Leaves* petioled, ovate-cordate, serrate. *Flowers* long-peduncled, axillary, and terminal. *Capsules* ovate, hid in the calyx.

Crusta ollæ minor. *Rumph. Amb.* 5. *p.* 460. *t.* 170. *f.* 3.

Annual, and like the rest, appearing in moist places during the rainy season.

Stem scarcely any. *Branches* generally opposite, diffuse, four-sided, from six to twelve inches long. *Leaves* short-petioled, cordate, serrate, smooth. *Flowers* terminal, and also from the exterior axills, long-peduncled, of a bright deep blue colour. *Capsules* ovate, rather shorter than the calyx.

8. G. *veronicifolia. Linn. sp. pl. ed. Willd.* 1. 103. *Corom. pl.* 2. *N.* 154.

Annual, while young erect, afterwards creeping. *Leaves* sessile, lanceolate, serrate. *Spikes* terminal. *Flowers* opposite. *Capsules* linear.

Crusta ollæ major. *Rumph. Amb.* 5. *p.* 460. *t.* 170. *f.* 2.

A native of similar places with the last described; flowering time the same.

Stem several, creeping. *Branches* erect, four-sided, smooth; from six to eight inches long. *Leaves* opposite, sessile, decussate, oblong, glandular, smooth, fleshy, fine and most

sharply serrate; serratures ending in a minute bristle. *Racemes* terminal. *Flowers* opposite, decussated, of a violet colour. *Corol*, &c. as in the last species. Page Carey Ed.

9. G. *racemosa. R.*

Annual, erect. *Leaves* sub-sessile, linear-lanceolate, entire. *Racemes* terminal, brachiate. *Flowers* long-pedicelled. *Capsules* linear, three or four times longer than the calyx. I.

A native of cultivated land over various parts of India, appearing in the rainy season. 139

10. G. *oppositifolia. Linn. sp. pl. ed. Willd.* 1. 105. *Corom. pl.* 2. *N.* 155.

Annual, sub-erect. *Lower* leaves opposite to each other or to a one-flowered peduncle, lanceolate, serrate. *Capsules* linear.

G. *oppositifolia. Retz. Obs. t.* 4. *N.* 5.

A native of moist pasture ground. Flowering in the wet season.

Stems several, nearly erect, ramous, four-sided, smooth; from three to six inches high. *Leaves* sessile, opposite to each other, or a flower, linear-lanceolate, serrate, smooth. *Peduncles* leaf-opposed, or opposite to each other, short, horizontal, clubbed. *Bractes* solitary, embracing the insertion of the peduncle. *Flowers* small, blue. *Anthers* two pairs united. *Sterile filaments* small, white. *Capsules* linear, twice the length of the calyx.

11. G. *serrata. R.*

Annual, erect, four-sided, smooth. *Leaves* opposite, stem-clasping, oblong, smooth, most acutely serrate. *Racemes* in the division of the branches, and terminal, long-peduncled. *Capsules* linear, diverging.

Beng. Bhoomi-nim.

Pee-tsjanga-puspum. *Rheed. Mal.* 9. *t.* 59. is exceedingly like this plant, though quoted by Linnæus for *Ruellia antipoda*, which I have never met with, if this be not it.

A native of Bengal, and in flower during the rains.

Root annual. *Stem* erect, four-sided, ramous, smooth, from two to eight inches high. *Leaves* opposite, sessile, or stem-clasping, oblong, very obtuse, most acutely serrate; smooth on both sides. *Racemes* solitary, terminal, and also from the divisions of the plant, on long, four-sided peduncles. *Flowers* opposite, short-pedicelled, verging, pink-coloured. *Bractes* I.
lanceolate, the lower pair of the racemes dentate. *Calyx* parted half way. *Corol*, upper lip 140.
small, incumbent. *Capsules* lanceolate, twice the length of the calyx.

12. G. *reptans. R.*

Annual, creeping. *Leaves* opposite, from oblong to round, serrate. *Racemes* terminal. *Sterile* filaments free. *Capsule* linear.

A native of the Moluccas; from thence introduced into the Botanic garden, where it blossoms during the rains.

Stems and *branches* round, smooth, and creeping close to the earth, with short, (about an inch long) floriferous, erect shoots. *Leaves* opposite, sub-sessile, on the creeping shoots round, on the erect flower-bearing ones oblong, with rounded apices; all serrate, and smooth on both sides. *Peduncles* or racemes terminal, on the short, erect shoots, bearing several, approximate pairs of short-pedicelled, opposite, large, pale bluish pink flowers. *Bractes* opposite, one-flowered, ovate. *Calyx* five-leaved. *Corol* with an enlarged throat, and ringent border; *upper lip* of one pale coloured segment; *under lip* broad, deeper coloured, and three-parted. *Sterile* filaments large, yellow, clavate, with the apices a little recurved, perfectly free. *Stigma* of two, thin, broad, round lobes. *Capsule* linear, as long as the calyx, two-celled, two-valved.

13. G. *parviflora. R. Corom. pl. N.* 203.

Annual, erect, ramous. *Leaves* sessile, ovate-oblong, three-nerved, serrate. *Flowers* long-peduncled, solitary. *Sterile* filaments two-cleft. *Capsules* oblong.

Stems erect, ramous, four-sided; with their angles acute, about six inches high. *Leaves* opposite, sessile, ovate-oblong, slightly serrate, acute, when large three-nerved. *Flowers* axillary, solitary, long-peduncled, small. I have seen some plants with white flowers, and others with blue ones. *Anthers* twin. *Sterile* filament two-cleft, each division headed. *Capsules* rather oblong, pointed, longer than the calyx. I.

14. G. *Monnieria. Linn. sp. pl. ed. Willd.* 1. 102. 141

Annual, creeping. *Leaves* sessile, long, obovate, entire. *Peduncles* axillary, solitary, one-flowered. *Calyx* seven-leaved. *Corol* campanulate; *stamina* four.

Beng. Adha-birni.

Teling. Sambrani-chittoo.

A native of moist places, borders of brooks, &c. Flowering time the wet and cold seasons.

Stems several, annual, creeping, round, jointed, very ramous, smooth, succulent. *Leaves* opposite, sessile, obovate, wedge-shaped, or oblong, smooth, entire, obtuse, fleshy, dotted with minute spots. *Peduncles* axillary, alternate, solitary, round, smooth, shorter than the leaves, one-flowered. *Flowers* blue. *Bractes* two-awled, pressing on the calyx laterally. *Calyx* five-leaved, the exterior three leaflets large, oblong, the two interior small, linear, all are concave, smooth, pointed and permanent. *Corol* campanulate; border five-parted, nearly equal. *Stamens* as in Didynamia. *Anthers* two-cleft, at the base, blue. *Stigma* large, somewhat two-lobed. *Capsule* ovate, two-celled, two-valved. *Seeds* very numerous.

Obs. This plant certainly ought to be placed in the 14th class; it has no one claim, that I can observe, to a place in this genus.

The natives use the expressed juice mixed with Petroleum, to rub on parts affected with rheumatic pains.

15. G. *hyssopioides. Linn. sp. pl. ed. Willd.* 1. 104. *Corom. pl.* 2. *N.* 128.

Annual, erect. *Leaves* ensiform, stem-clasping, much shorter than the stem joints. *Pe-*

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duncles axillary. *Capsules* linear-oblong.

G. *hyssopioides. Kön. in Retz. Obs.* 4. *p.* 8. *Linn. spec. pl. ed. Reichh.* i. 48. Appears with the former species during the rains.

16. G. *Juncea. Corom. pl.* 2. *N.* 129.

Annual, erect, columnar, nearly naked. *Lower* leaves lanceolate, stem-clasping; above minute. The two pair of anthers not united. *Capsules* globular.

Like the rest, this species delights in a wet situation, where it appears and flowers during the rains.

Stem erect, almost simple, round, jointed, smooth, from six to twelve inches high. *Leaves* opposite, stem-clasping, lanceolate, obtuse, entire. *Floral leaves* minute, triangular. *Peduncles* axillary, solitary, one-flowered. *Flowers* rose-coloured, small. *Anthers* twin, not united. The sterile filaments in this species stand between the fertile ones, and are very small. *Capsules* globular.

17. G. *cuneifolia. R.*

Annual, erect, simple, nearly naked. *Leaves* one pair at the base, cuneiform, obtuse; above one or two minute pairs. *Flowers* solitary, long-peduncled. *Capsules* round.

A native of wet places on the coast of Coromandel, and nearly allied to G. *lobelioides*, and *juncea*.

18. G. *lobelioides. Linn. sp. pl. ed. Willd.* 1. 104. *Retz. Obs.* 4. 7. *Vahl. enum.* 1. *p.* 92.

Annual, on the lower part of the simple stem grew from two to four pair of approximate, lanceolate, entire, sessile leaves. *Flowers* toward the apex, remote, solitary, long-peduncled. *Capsules* round.

A native of Coromandel, growing in wet places during the rainy season.

UTRICULARIA. Schreb. gen. N. 41.

Calyx two-leaved. *Corol* ringent, and generally calcarate. *Capsule* superior, one-celled. *Seeds* numerous.

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1. U. *stellaris. Linn. sp. pl. ed. Willd.* 1. 113.

Floating, leafless. *Scape* with a verticil of bladders. *Corol* without a nectary.

Teling. Natsoo.

Grows in sweet waters, appears and flowers during the rains.

Root conferva-like, swimming in, and not on the water; I have always found small utriculi adhering to its filaments. *Scape* sub-erect, simple; raceme above the verticil of bladders, which rest on the surface of the water.

2. U. *fasciculata. R.*

Floating, leafless. *Scapes* naked; *racemes* four to eight-flowered. *Utriculi* sub-ovate, two-horned, scattered amongst the fibres of the root. *Nectary* horn-shaped, ascending to the edge of the under lip. *Capsules* beaked, drooping.

Teling. Natsoo.

Beng. Janjee.

Found swimming in stagnant water in the vicinity of Calcutta, at the end of the cold, and beginning of the hot seasons.

Stem jointed, length various, but often extending some feet. *Radicles* most numerous, in alternate fascicles, multifid, filiform, armed with minute, acute bristles pointing forward. *Utriculi* scattered, semi-ovate, dotted, becoming black by age, with two horns from the mouth. *Scape* erect, from four to eight inches high, bearing generally from four to eight, alternate, large, yellow, pedicelled flowers. *Bractes* ovate, obtuse, one-flowered. *Calyx* of two large, permanent leaflets. *Corol* as in the genus. *Nectary* horn-shaped, blunt, nearly as long as the under lip, and bending up to its margins. *Capsules* conical, pointed, reflected.

3. U. *biflora. R.*

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Floating, leafless. *Scape* naked, two-flowered. *Utriculi* ovate, with filaments from their apices. *Nectary* horn-shaped, ascending, as long as the under lip. *Capsules* globular, erect.

Beng. Chota-janjee.

Found with the last described in stagnant water near Calcutta, during the same seasons. A much smaller plant.

Root of a few, scarcely compound, filiform fibres, and some scattered, subulate nigrescent utriculi, with two or more filaments from their apices, or mouths. *Scape* about three inches high, filiform, naked, generally two-flowered. *Flowers* yellow, small. *Calyx* and *corol* as in the genus, with the faux closed, and a horned, ascending nectary as long as the under lip. *Capsules* globular, erect.

LYCOPUS. Schreb. gen. N. 44.

Corol four-cleft, with one of the divisions emarginate. *Stamina* distinct. *Seeds* four, retuse.

1. L. *dianthera. Buch.*

Annual, erect, four-sided. *Leaves* petioled, rhomb-ovate, serrate. *Calyx* bilabiate.

A native of Nepala; from thence Dr. Buchanan sent the seeds to this garden, (in 1802,) where the plants thrive during the cold season, and blossom in March and April.

Stems annual, straight, four-sided; *sides* slightly grooved; angles somewhat hairy. *Branches* axillary, decussate, four-sided, &c. like the stem; height of the whole plant from one to two feet. *Leaves* opposite, petioled, declined, rhomb-ovate; anterior margins serrate, dotted with minute, darker green glands underneath, general length about one inch, or less.

Racemes terminal. *Bractes* opposite, lanceolate, one-flowered. *Flowers* pedicelled, small, very pale pink, almost white. *Calyx* bilabiate; *upper lip* ascending, tridentate; *lower lip* bipartite, and defended with hair on the inside. *Corol; tube* short, somewhat four-sided; *upper* division of the border broad and emarginate; *lateral* two of the same length, but narrower and semicircular; *under* one large, and nearly round. *Filaments* four, short, in the angles of the tube of the corol. *Anthers* twin on the long filaments, and tending to be so on the shorter ones, but very small, and abortive. Is nearly allied to *Thymus*. Page Carey Ed. I. 145

SALVIA. Schreb. gen. N. 50.

Corol irregular. *Filaments* two-forked; *anthers* on the superior ones. *Seeds* naked.

1. S. *Bengalensis. Kön. MSS.*

Shrubby. *Leaves* linear-ovate, lanceolate, entire. *Racemes* verticelled, verticils distinct, many-flowered. An *anther* to each division of the filaments.

The natives on the Coromandel coast have no name for it. From Bengal it was introduced into the gardens on the coast a few years ago, by Mr. Parsons; and is only found in gardens, where it grows to be a large, straggling shrub.

Trunk seldom erect, woody, sometimes as thick as a man's arm. *Bark* cracked, and peeling off in irregular pieces. *Young shoots* downy, round. *Leaves* as in *salvia officinalis*. *Racemes* terminal, often compound, verticelled. *Verticils* approximate, globular, many-flowered. *Flowers* white. *Calyx* gibbous, downy, three or four-toothed. *Corol*, both lips recurved, or spreading. *Stamens*, there are sometimes three or even four filaments, with their extremities bifid, each division bearing an oval proper *anther*.

Obs. The leaves of this plant smell and taste considerably stronger, I think, than those of S. *officinalis*, and are applied to the same uses.

2. S. *brachiata. R.*

Annual, erect, brachiate. *Leaves* oblong, crenate, tomentose. *Racemes* verticelled; *verticils* six-flowered; *seeds* elevated on a receptacle.

Is a native of moist places, over various parts of India. Flowering time the cold season. I. 146

Stem annual, erect, ramous, four-sided, four-grooved, downy; from one to two feet high. *Branches* opposite, cross-armed, ascending. *Leaves* opposite, petioled, running down on the petioles, oblong, irregularly crenulate, waved, rugose, a little downy; two or three inches long. *Racemes* terminal, long, verticelled. *Verticils* six-flowered, six-bracted. *Flowers* small, pale purple. *Stamens* as in the genus, with the rudiments of two additional sterile filaments between the large pair. *Germ* elevated on a large fleshy receptacle. This plant is slightly aromatic.

3. S. *lanata. R.*

Herbaceous, four-sided, villous. *Leaves* sessile, ovate-oblong, entire, woody. *Flowers* verticillate.

Found by Colonel Hardwicke on the most elevated mountain near Adwaanee, on the road from Hurdwar to Sirinagur. It is his S. *integrifolia*. See *Asiatic Researches, vol.* 6. *p.* 349.

Obs. Salvia rosea of Vahl, is the same as S. *coccinea*, an American plant, which though in a manner naturalized here, has no right to a place in this Flora.

BOERHAAVIA. Schreb. gen. N. 13.

Calyx inferior, gibbous, entire, permanent, and becoming an envelope for the seed. *Germ* one-celled; *ovula* single, erect. *Corol* campanulate, inserted on the calyx. *Seed* solitary. *Embryo* conduplicate, with inferior *radicle*, and central *perisperm*.

1. B. *procumbens. Herb. Banks.*

Root fusiform, perennial. *Branches* procumbent, smooth. *Leaves* variously cordate, covered with a silver coloured pellicle underneath. *Flowers* terminal, in long-peduncled heads. *Stamina* three.

Sans. Poonurnuva, Shotughnee. I.

Beng. Gadha-poorna, the red variety; and Shweta-poorna, the white one. 147

Talu dama. *Rheed. Mal.* 7. *p.* 105. *t.* 56. good for a young luxuriant plant.

B. *diandra*, and *erecta. Burm. Flora. Ind. p.* 3. *t.* 1. seem to be our plant, taken at different ages.

B. *erecta. Gært. Carp.* ii. 209. *t.* 127.

This species, whatever it may be, whether *diffusa, erecta, repanda* or *diandra*, or all of them, is the only one I have yet found in India. It is not common every where, but is one of the most troublesome weeds we have. The long, fusiform, perennial roots, strike so deep, as to render it no easy task to dig them up. It produces blossoms and ripe seed during the whole year.

Root perpendicular, fusiform, slender, perennial. *Stem* none; *branches* many, herbaceous, with alternate, bifarious, round, smooth, jointed, often coloured branchlets spreading close on the ground, to an extent of many feet in a good soil, but never striking root. *Leaves* opposite, unequal in size, one of the leaves being alternately smaller in each pair; petioled, variously cordate, margins more or less scalloped, waved, and often coloured; sometimes acute, sometimes obtuse; all are smooth above, and covered with a silver coloured pellicle underneath; size very various. *Petioles* shorter than the leaves, channelled. *Peduncles* solitary, from the naked swelled joints between the leaves, but nearest to the small leaf. At the ends of the *branches*, where the joints approximate, they are so numerous as to form a

Page Carey Ed. panicle, each supporting, from one to five, or six small heads of sessile, red or white, minute flowers. *Calyx* (apparently the germ), beneath, five-sided, covered with headed glutinous glands; *mouth* entire, and much contracted. *Corol* campanulate, plaited, inserted on the crown of the calyx. *Nectary*, a small fleshy, three-toothed cup, surrounding the base of the germ, in the divisions of which the filaments are inserted. It requires a powerful lens, and much patience to understand the structure of this part of the flower. *Filaments* generally three, as long as the style. *Anthers* of two round lobes. *Germ* oblong, hid in the belly of the calyx, one-celled; *ovulum* single, attached to the bottom of the cell. *Style* slender. *Stigma* peltate. *Pericarp* turbinate, five-sided, covered with clammy, pedicelled glands, &c. exactly as in Gærtner's figures of his *Boerhaavia erecta.*

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Obs. There are two varieties of this plant in Bengal; one with red, the other with white flowers; in other respects they are the same. In the St. Helena plant, B. *repanda* of the *Hortus Bengalensis*, the leaves are more angular, the inflorescence terminal, racemes verticelled, with one bracte only to each pedicel.

FRAXINUS.

Polygamous. *Calyx* none, or four-parted. *Corol* none, or four-petalled. *Samara* one-seeded, with lanceolate wings.

1. F. *chinesis. R.*

Arboreous, with erect branches. *Leaflets* from three to seven, lanceolate, serrate. *Panicles* axillary, and terminal. *Flowers* without petals.

A native of China, from thence introduced into the Botanic garden by the late Col. Robert Kyd, prior to 1793: where they blossom in April, but have not produced seed, or even full grown seed vessels.

Our small trees have little or no *trunk;* but several, erect, straight *branches* and *branchlets;* giving an entire height of from ten to twelve feet. *Leaves* opposite, pinnate, and ternate. *Leaflets* from three to seven, opposite, lanceolar, serrate, smooth. The pairs short-petioled, much smaller and shorter in proportion to their breadth than the terminal one, which is protruded on a longer winged petiolet. *Petioles* channelled, sometimes with a marginal wing. *Panicles* axillary, and terminal, small, drooping, and composed of most slender, simple and compound, sub-verticelled ramifications. *Calyx*, in all four-toothed. *Corol* none. *Filaments* in the completely *hermaphrodite flower* much longer than the calyx. In the *female* wanting, or abortive, and hid within the calyx. *Male flowers* not found. *Germ* ovate. *Style* long, and curved. *Stigma* emarginate.

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LIGUSTRUM.

Corol four-cleft. *Berry* superior of two cells with two seeds in each cell.

1. L. *nepalense. Wall.*

Leaves ovate, or ovate-oblong, acuminate, villous below. *Panicle* terminal, villous, consisting of sub-erect crowded racemes.

A native of the mountains of Nepala, where it is called *Goomgacha* and grows to be a considerable tree, producing profuse clusters of white, sweet smelling flowers from April to June; *berries* ripen in four to six months.

Branches round, opposite, ash-coloured, dotted with callous spots; all the younger parts covered with abundance of soft hairs. *Leaves* opposite, spreading, on very short channelled petioles, varying considerably in size and figure, mostly ovate with a rounded base, sometimes oblong or lanceolar, generally tapering into a long apex, terminated by a short cylindric point; from one to two, or even three inches long, of a firm texture, shining above, densely villous underneath, when old entirely smooth, with very fine remote nerves communicating with each other in reticulated arches near the margin. *Panicle* somewhat contracted, ovate, from four to six inches long, sessile, consisting of pretty crowded racemes, the uppermost very short and alternate. *Peduncles* round, villous, with a deciduous small lanceolate bracte under each division. *Flowers* short-pedicelled, smooth, disposed in small bunches. *Calyx* truncate, with four hardly discernible teeth. *Corol; tube* equalling the calyx; segments of the limb spreading, lanceolate, acute, twice as long as the tube. *Stamina* almost as long as the corol: *filaments* inserted within its mouth between two opposite fissures; *anthers* oblong, bursting lengthways on both sides. *Pistil* shorter than the stamina, smooth; *ovarium* roundish, two-celled, with two pendulous ovula in each cell; *style* short; *stigma* fleshy, oblong, acute. *Berries* oval, dark blue, with a beautiful bloom on them, rather smaller than those of the common *Privet;* pulp brown. *Seeds* one or two; *cotyledons* broad-ovate. In other respects like those of Ligustrum. *Gært. Carp.* ii. 72. *tab.* 92.

I. 150

Obs. This species differs from L. *japonicum*, Thunb. and *lucidum*, Ait. in the figure and villosity of its leaves and the contracted shape of its panicle. It may perhaps be found the same as L. *sinense*, Lour. especially if the racemes, which in the *flora Cochin-chinensis* are attributed to that tree, are considered as panicles, which indeed has been done by the illustrious author of that article in Rees's New Cyclopædia.

VERBENA. See *Didynamia Angiospermia.*

DIANDRIA TRIGYNIA.

PIPER. Schreb. gen. N. 59.

Ament filiform, imbricated with peltate scales. *Corol* none. *Germ* one-celled, with a

single, erect *ovulum*. *Berry* one-seeded. *Embryo* inverse, and furnished with an ample perisperm. Page Carey Ed.

1. P. *nigrum*. *Linn. sp. pl. ed. Willd.* 1. 159.

Leaves bifarious, obliquely ovate-cordate, acuminate, polished, from five to seven-nerved.

Pepper-vine. Marsden's *History of Sumatra, p.* 105.

Molago-codi. *Rheed. Mal.* 7. 23. *t.* 12.

Sans. Vellojung, Mareechung, Murichung, Kolukung, Krishnamooshanung, Dhurmupattanung. I.

Hind. and *Beng.* Murich, or Gol-murich. 151

Tam. Moloovoo-kodi.

Pers. Pilpil.

Arab. Filfil.

Malay. Ladda.

Cultivated in various parts of India, and its Islands.

2. P. *trioicum*. *R.*

Triœcous, shrubby, rooting. *Leaves* bifarious, obliquely-ovate, acuminate, from five to seven-nerved, glaucous. *Aments* leaf-opposed, cylindric, pendulous.

Teling. Murial-tiga.

Roots long, striking deep into the earth. *Stem* jointed, winding, when old woody, and scabrous, running along the ground to a great extent, or up trees, &c. when trained to them; from each joint issue roots which take firm hold of whatever they meet with. *Branches* numerous, alternate; the young ones smooth, the old ones woody, and scabrous like the stem. *Leaves* alternate, petioled, cordate, broad-oval, ovate, or oblong, pointed, from five to seven-nerved, (generally five,) above, smooth and glossy, below, lighter coloured, often somewhat bubbled, from four to six inches long, and from two to four broad. *Petioles* channelled, smooth, an inch or an inch and a half long. *Stipules* solitary, spathiform, falling off when the leaf begins to be unfolded.

Male Plant. *Calyx* an *ament*, leaf-opposed, peduncled, filiform, pendulous, closely imbricated with five spiral rows, of fleshy, oval, one-flowered scales. *Scales* oblong, peltate, sessile, one-flowered. *Corol* none. *Filaments* three, very thick, and very short, scarcely elevating the *anthers* above the margins of the scales of the ament. *Anthers* four-lobed. *Pistil*, in some, a minute cylindric gland in the centre, in others, not the smallest rudiment of one.

Female Plant. *Calyx* an *ament*, leaf-opposed, shorter, thicker, and more rigid than in the male, imbricated with three spiral rows of scales. *Scales* as in the male. *Corol* none. I. *Stamens* none. *Germ* sessile, globose, immersed in the substance of the ament. *Style* none. 152 *Stigma* three-lobed, white, glandular. *Pericarp*, a small, round, red, somewhat fleshy berry. *Seed* one, globose.

Obs. When I described the three vines included in this one species, I had not seen *Piper nigrum*, and took it for granted that this was it; but as soon as I had an opportunity of seeing that famous plant, I was immediately convinced that they were distinct species. In *trioicum*, the leaves have a glaucous appearance, which readily distinguishes it from P. *nigrum*, which has shining dark green leaves.

This vine I have found wild amongst the chain of mountains directly north from Coringa, in the Raja-mundri Circar. It delights in a moist, rich soil, well shaded with trees; to them it adheres most firmly, by means of the roots which issue from the joints. Flowering time, in their wild state, during the latter part of the wet season, September and October. The pepper ripens in March. With me, in a cultivated state, they flower almost all the year round, but chiefly during the fore-mentioned period.

I have not met with any author, or any sort of information, that could lead me to think black pepper was the produce of a diœcous plant, (male and female on distinct vines,) till upon examination, I found it was so. Attention to this circumstance will, I think, render the culture of pepper much more certain, and successful, viz. by planting to each prop tree a male and female plant, the male on the sides from whence the most prevailing wind blows; and the female on the other.

The vegetable world is full of proofs that the *sexual system* of the immortal Linnæus is founded on the soundest principles; and not a single plant have I ever found in India, that does not corroborate this fact. The Arabians from time immemorial knew, that to render the *female* date-tree prolific, it was necessary to bring it in contact with the *male*; which I. they do by making a slit in the spathe of the female flower, just before it is ready to burst 153 and thrusting therein a branch of the male spadix. I have therefore the utmost reason to conclude the pepper vine will be much more productive, if the above-mentioned circumstance be attended to, by the cultivators. I think, if the Malays in Sumatra had known it, the accurate Mr. Marsden would not have neglected mentioning so material a circumstance, when describing this plant, and the method of cultivating it there.

Soon after the above description was made, I found a third vine bearing aments with *hermaphrodite* flowers; or *hermaphrodite* and *female* flowers mixed on the same aments. At the same time I found that the pepper of the female vine did not ripen properly, but dropped while green, and immature from the plant, and that when dried it had not so much pungency as common pepper, whereas the pepper of this third sort ripens perfectly, when dry is exceedingly pungent; and has been, by pepper merchants at Madras, reckoned equal, if not superior to the best pepper of the Malabar coast, or Ceylon; consequently this must be the sort that is found cultivated; the other two being, I conjecture, entirely neglected.

The *hermaphrodite* plant grows wild, with the male and female, in the moist, uncultivat-

Page Carey Ed. ed, over-run shady vallies, up amongst the mountains; and also upon the mountains, where springs keep them moist. Such places are common in the cliffs of the rocks, and there the vines thrive with the greatest luxuriance. In its stem, branches, leaves, and stipules, it agrees perfectly with the other two. The aments are also the same in every respect, except that here are four spiral rows of flowers; the *scales* of the *ament* are as in the other two, viz. the male and female plants. *Stamens*, generally two, fleshy, clubbed filaments, shorter than the germ, and placed laterally, so as to press upon it. It frequently happens that they are
I. entirely wanting, or only one is present. *Anthers* two oval pits in the apex of each filament.
154 *Germ* globular, immersed in the substance of the ament. *Style* none. *Stigmas* three, spreading. *Berry* globular, size of a small pea, red, smooth, one-celled. *Seeds* solitary.

3. P. *longum*, *Willd.* 1. 161.

Dicœous, shrubby, creeping. *Lower* leaves petioled, broad-cordate, floral leaves sessile, stem-clasping, oblong-cordate; all are from five to nine-nerved.

Cutta-tirpali. *Rheed. Mal.* 7. *p.* 27. *t.* 14.

Sans. Krishna, Oopukoolya, Videhee, Magudhee, Chupula, Kuna, Ooshuna, Pippulee, Shoundee, Kola.

Beng. Pippul, the root Pippula-moola.

English. Long pepper.

Pippul-chittoo is the Telinga name of the plant, and Pippuloo the pepper.

The plant I have found wild amongst bushes, on the banks of water courses, up towards the Circar mountains. It flowers and bears fruit during the wet and cold seasons.

Root woody, perennial. *Stems* many, creeping, jointed, round; *joints* swelled; *young shoots* downy. *Branchlets* bearing the fruit are erect, with the leaves sessile, or nearly so. *Leaves* on the creeping branches largest, petioled, broad-cordate, seven-nerved; on the erect, fruit-bearing branchlets (*floral leaves*) stem-clasping, oblong-cordate, five-nerved; all are smooth, somewhat wrinkled; below pale green; size various. *Stipules* of the petioled leaves two, joining length-ways to the petioles, lanceolate; of the sessile leaves within the leaf, single, spathiform.

Female flowers. *Ament* sessile, leaf-opposed, peduncled, erect, cylindric, imbricated with five, or more, spiral rows of small, orbicular, permanent, peltated, one-flowered scales. *Calyx* none. *Corol* none. *Stamens* none. *Germs* numerous, aggregate, sessile, sub-orbicular. *Style* none or exceedingly short. *Stigmas* three or four-lobed. *Pericarp* aggregate, sub-cylindri-
I. cal, composed of firmly united, one-seeded drupes. *Seed* ovate, smooth.
155 *Obs.* It is in Bengal only, so far as I have been able to learn, that this plant is cultivated for its pepper. When the pepper (ament) is full grown, it is gathered and daily exposed to the sun, till perfectly dry; after which it is packed up in bags for sale.

The roots, and thickest parts of the creeping stems, when cut into small pieces and dried, form a considerable article of commerce all over India, under the name of *Pippula moola*; for which purpose it is particularly cultivated in many of the vallies amongst the Circar mountains. This sort is more esteemed, and bears a higher price than that of Bengal; where by far the largest proportion is cultivated. It is, as well as the *pepper*, chiefly employed medicinally, and the consumption of both these drugs is very great.

Cultivation in Bengal. The long pepper is not propagated by seed, but by suckers, and requires to be cultivated upon a rich, high, and dry soil. The suckers are transplanted soon after the setting in of the periodical rains, and the pepper (which is preserved merely by drying it in the sun), is gathered in the month of January, after which the stalk, and branches of the plant wither, and the roots only remain alive. A bigha of land (the third of an English acre) will yield in the first year about a maund (eighty-four pounds) of the pepper, in the second year four maunds; and in the third, six; after which, as the plant becomes annually less and less productive, the roots are grubbed up, dried, and sold; and fresh roots or young shoots are set in their stead, the earth requiring merely a slight covering of manure. The plants are never to be watered, and at the commencement of the hot season the roots are to be carefully covered with straw to preserve them against the heat of the sun. The plants should be set about five feet asunder. Large quantities of this pepper and also of the roots are exported to Bombay, and Surat; where both are in great demand, the first for culinary,
I. the latter for medicinal purposes. The ryots in this part of the country, usually sow radishes,
156 or barley, or plant *brinjals* (*Solanum melongena*), in the intermediate space between the plants.

4. P. *Chaba*. W. Hunter in *Asiat. Res.* ix. 391.

Shrubby, creeping. *Leaves* short-petioled, ovate-lanceolate, base unequal, scarcely triple-nerved; *aments* leaf-opposed, erect, cylindrico-conical, firm and fleshy.

Sans. Chavyung, Chavika, Chavee, Chavikung.

Beng. Choee.

Piper longum, *Rumph. Amb.* 5. *p.* 333. *t.* 116. *f.* 1.

Obs. Cattu-tirpali. *Rheed. Mal.* 7. *p.* 27. *t.* 14. represents a very different species, the fruit of which is also used over the continent of India, and particularly in the western part thereof, as *long pepper*, and is much cultivated in Bengal, chiefly for its root, which the natives call Pippula. Woodville's figure, in his *Medical Botany*, is very bad, for it answers neither to this, nor P. *longum*, *Linn. sp. pl. ed. Willd.* 161, which may be called the long pepper of the continent of India. Blackwell's figure is still worse.

5. P. *sylvaticum*. *R.*

Leaves all petioled, broad-cordate, from five to seven-nerved, obtuse; lobes of the base large, equal, circular. *Aments* erect, short-peduncled, columnar; male flowers tetrandrous.

A native of the mountains on the north-west border of Bengal, where the natives call it

Pahari peepul, or *mountain* long pepper, and use it, both green and ripe, in their dishes. In the Botanic garden it blossoms, and the berries ripen during the rains. Page Carey Ed.

Root perennial. *Stem* or rather branches creeping on the ground, or rooting on trees like Ivy, and most of the East India species of pepper; all the young parts polished. *Leaves* alternate, petioled, equally-cordate, obtuse, from five to seven-nerved, smooth, from three to five inches long, by from two to four broad. *Petioles* from one to two inches long grooved. *Stipules* interfoliaceous, &c. as in the genus. *Male aments* leaf-opposed, short-peduncled, or columnar, slender. *Scales* one-flowered. *Corol* none. *Filaments* generally four, oval, fleshy, very short. *Anthers* one-celled. *Germ* none. *Female aments* on a different plant, leaf-opposed, short, peduncled, cylindric. *Germ* oval, one-celled, ovula single, erect, that is, attached directly to the bottom of the cell. I. 157

6. P. *peepuloides. R.*

Leaves equally-ovate, and ovate-lanceolate, short-petioled, from three to five-nerved, smooth, acuminate. *Aments* sub-sessile, cylindric.

Pippul the vernacular name in Silhet, and on the adjacent range of mountains where it is indigenous, and considered the *Pippul*, or *long pepper* of that country, and as such is used in medicine, &c. It differs specifically, no doubt, from the long pepper plant of lower Bengal, as well as from that of Rumphius, called P. *Chaba* by Dr. W. Hunter, who found it common on the Island of Pulo-Pinang. It is immediately known from P. *longum* by the shape of the leaves, as well by their being all equally petioled; and from P. *Chaba*, by both sides of the base being equal, or nearly so; whereas in *Chaba* the lower side is much larger and longer.

Root perennial. *Stems* and alternate branches creeping, young shoots smooth. *Leaves* alternate, short-petioled, from ovate-oblong to lanceolate, entire, acuminate; generally five-nerved, of which the exterior two are minute, and when absent the leaf is perfectly three-nerved, from three to five inches long, by from one to three broad. *Stipules* stem-clasping and petiolary. The *female aments* have only been found, which induces me to think this species is dicœous, as most of them are; they are short-peduncled, solitary, and directly opposite to the leaves. *Berries* smaller than in common black pepper (P. *nigrum*) obliquely oval; pulp in small quantity, one-celled. *Seeds* solitary, conform to the berry. *Perisperm* conform to the seed. *Embryo* minute, lodged in a little hollow in the apex of the perisperm. I. 158

7. P. *Betle. Linn. sp. pl. ed. Willd.* 159.

Perennial, dicœous, creeping. *Leaves* alternate, bifarious, cordate, from five to seven-nerved, smooth, entire. *Female aments* sub-cylindric, drooping.

P. qui saururus, &c. *Burm. Zeyl. p.* 193. *t.* 83. *f.* 2.

Beetla-codi. *Rheed. Mal.* 7. 29. *t.* 15.

Sans. Tamboolavullee, Tamboolee, Naguvullee.

Hind. and *Beng.* Pan.

I have never met with this plant in its wild state. It is much cultivated over India and the Malay countries.

Root woody, ramous. *Stems* woody, creeping on the earth, or rising up trees, poles, &c. when carefully trained to them; smooth on every part; innumerable roots issue from the joints, by which the plant is well supported after they have taken hold. *Leaves* alternate, petioled, bifarious, from broad-cordate to obliquely ovate-oblong, somewhat pointed, from five to seven-nerved, entire, smooth; from four to six inches long, and from two to four broad. *Petioles* of various lengths, and channelled. *Stipules* as in P. *nigrum*. *Female aments* leaf-opposed, peduncled, filiform, sub-pendulous, closely imbricated with several spiral rows of scales, and corollets, exactly as in P. *trioicum*. The *male flowers* I have never found.

Obs. The plants are constantly raised from the slips, and cuttings, these are carefully planted in a rich moist soil, well inclosed, and shaded, so that they are in great measure, protected from both sun and wind. In some places, small plantations of *Æschynomene grandiflora*, are made to train them to, and to keep off the sun; in others, poles are employed for the first, and a thin shed of mats over them for the latter purpose, they require to be frequently watered during the dry weather. Every history of India describes, and every body knows, the use the Hindoos of all ranks make of the leaves of this plant.

8. P. *Cubeba. Gært. Carp.* ii. 67. *Linn. sp. pl. ed. Willd.* 159. I. 159

Shrubby, creeping. *Leaves* petioled, ovate-lanceolate, scarcely triple-nerved. *Aments* leaf-opposed, on peduncles longer than the petioles. *Berries* pedicelled.

Piper canninum. *Rumph. Amb.* 5. *t.* 28. *f.* 2.

A native of Prince of Wales' Island and the countries to the eastward of the Bay of Bengal.

9. P. *lanatum. R.*

Creeping, every part very woolly. *Leaves* petioled, ovate-lanceolate, scarcely three-nerved. *Aments* leaf-opposed, one-peduncled, as long as the petioles. *Berries* pedicelled, clavate.

A native of the Malay Archipelago.

10. P. *methysticum. Linn. sp. pl. ed. Willd.* 161.

Leaves short-petioled, from salient to obliquely re-entering, cordate, from seven to nine-nerved, entire, smooth.

A native of the Malay Archipelago. There is no doubt but this is the Sirium *decumanum. Rumph. Amb.* 5. *t.* 27. but whether it be the South Sea Island intoxicating species, I cannot take upon me to say. The leaves are often a foot long, by six or eight inches broad, on sheathing petioles not more than an inch long. I have not seen the fruit.

11. P. *arborescens. R.*

Arboreous, creeping. *Leaves* petioled, ovate-elliptic, acute, five-nerved. *Aments* leaf-

Page Carey Ed. opposed, long, slender, cylindric, on peduncles about as long as the petioles.

Sirium arborescens tertium. *Rumph. Amb.* 5. *t.* 28. *f.* 1.

A native of the Molucca Islands.

I. 160 12. P. *lanceolatum. R.*

Shrubby, creeping. *Leaves* short-petioled, broad-lanceolate, prominently five-nerved, smooth. *Aments* leaf-opposed, long-peduncled, filiform.

A native of the Molucca Islands.

13. P. *Malamiris. Linn. sp. pl. ed. Willd.* 160.

Shrubby, creeping. *Leaves* rather long-petioled, from salient to re-entering, cordate, five or seven-nerved. *Aments* leaf-opposed, filiform, on peduncles that are generally shorter than the petioles.

Amalago. *Rheed. Mal.* 7. *t.* 16.

Sirium. *Rumph. Amb.* 5. *t.* 116. *f.* 2. is no doubt P. *Betle*, consequently must be excluded from the list of synonyms belonging to this species.

14. P. *rostratum. R.*

Creeping, tender parts hairy. *Leaves* short-petioled, obovate, cuneate, obtuse-pointed, villous, five or seven-nerved, downy, meeting above the base. *Aments* leaf-opposed, short-peduncled. *Berries* beaked.

A native of the Moluccas.

15. P. *diffusus. Vahl. enum. pl.* 1. 333.

Leaves long-petioled, round-cordate, sharp-pointed, five or seven-nerved, smooth. *Aments* cylindric, short-peduncled.

Sirium *frigidum. Rumph. Amb.* 5. 345. *t.* 119. *f.* 2.

A native of the Moluccas.

16. P. *sarmentosum. R.*

Erect, ramous at the top, sarmentose. *Leaves* from broad-cordate to oblong, smooth, five-nerved, the superior ones sub-sessile. *Aments* leaf-opposed, short-peduncled.

P. *latifolium.* Hunter in *Asiat. Res.* ix. 392.

Gadu. Cando, or Gudukh, of the Malays.

A native of the Malay Islands, and brought by Mr. Smith into the Botanic garden, where I. 161 it thrives luxuriantly, and is in fruit most part of the year.

Stems erect, from six to eighteen inches high, ramous at top, jointed, and smooth. *Sarmentose* shoots of a great length, issuing in abundance from the top of the root, and the lower part of the stem, by which the plant is quickly propagated to any extent. *Leaves* alternate, the lower ones petioled, broad, re-entering, cordate; the upper ones sub-sessile, obliquely oblong; all are smooth on both sides, and shining on the upper one. *Aments* solitary, opposite to the leaves, short-peduncled, oblong, very small, being rarely more than a quarter of an inch long. *Germs* oval, one-celled; *ovulum* one attached by the base to the bottom of the cell. *Fruit* compound, sub-cylindric, about the size of an infant's finger, when ripe softish, and of a dark green or livid colour. *Berries* numerous, most of the germs prove abortive, one-celled. *Seed* solitary, oval, attached to the bottom of the cell. *Integuments* single, thin, light brown. *Perisperm* conform to the seed, friable. *Embryo* shape of a small broad inverted cone lodged in the apex of the perisperm. *Radicle* superior.

17. P. *angustifolium. R.*

Scandent, or creeping, smooth. *Leaves* sessile, obliquely-lanceolate, very smooth. *Aments* leaf-opposed, short-peduncled.

A native of the Malay Archipelago.

18. P. *saxatile. Wall.*

Stems furrowed, creeping, with villous joints and fascicled sub-erect branches. *Leaves* sub-sessile quatern, obovate-cuneate, fleshy, convex and villous beneath, with three coloured nerves, veinless. *Spike* terminal, filiform, elongated, peduncled.

A native of the neighbourhood of Katmandu in Napala, where it grows on rocks and blossoms during the first four months of the year. A small succulent, probably annual spe- I. cies, which creeps to a considerable extent, sending forth fascicled, sometimes single, opposite 162 or alternate branches from each joint, which scarcely rise four inches above the surface on which the plant grows. *Stems* thread-like, pubescent, with four or five furrows; *branches* once or twice sub-divided into small opposite branchlets. *Leaves* generally quatern, rarely tern, four or five lines in length, obtuse, cuneate at the base, shining and somewhat concave above, with copious short hairs below, slightly ciliated, without veins or ribs, and losing even the three pale-coloured nerves when dry; the lowest verticils many times, the others two or three times, shorter than the interstices between the joints. *Leaves* of the young shoots linear-oblong, measuring sometimes an inch in length. *Petioles* very short, villous, erect, with a gland-like body in their axills, villous. *Spike* terminal, very slender, from an inch to an inch and a half long, round, villous, excavated on its surface with innumerable small pores in which the flowers are lodged, on a peduncle about half its length.

Obs. All the parts of this elegant little species have a faint pungent taste. I have not been able hitherto to examine its organs of fructification in a satisfactory manner.

CLASS III.

TRIANDRIA MONOGYNIA.

VALERIANA. Schreb. gen. N. 60.

Calyx none. *Corol* superior, one-petalled, gibbous on one side of the base. *Seed* one.

1. V. *Jatamansi.* Sir W. Jones in *Asiat. Res. vol.* ii. *p.* 405, and *vol.* iv. *p.* 109. Roxb. *ibid.* 433.

Flowers triandrous. *Leaves* entire, four-fold, the inner radical pair petioled, and cordate; *cauline* sessile, lanceolate. *Seeds* crowned with a papus.

V. *spica. Vahl. en. pl.* 2. 13.

OLAX. Schreb. gen. N. 61.

Calyx entire. *Corol* three-petalled. *Nectary* of a few abortive filaments inserted on the petals. *Germ* one-celled; *ovulum* one, erect. *Drupe* half hid in the enlarged calyx, one-seeded. *Embryo* inverse, and amply furnished with a perisperm.

1. O. *scandens. Corom. pl.* 3. *N.* 102.

Shrubby, scandent. *Leaves* ovate-oblong. *Petals* and nectarial filament bifid.

Fissilia psittacorum. Linn. sp. pl. ed. Willd. 1. 194.

Roxburgia baccata. König's Mss.

Teling. Turka-vepa.

A large, woody, climbing shrub, a native of forests. Flowers all the year round. I.

Trunk leaning, often as thick as a man's thigh. *Branches* numerous, climbing. *Thorns* 164
one here and there over the old woody parts only, very large and strong, shaped like the horn of a Rhinoceros. *Leaves* alternate, bifarious, petioled, oval, entire, smooth, about two inches long, and one broad. *Racemes* axillary, solitary, half the length of the leaves, few-flowered. *Flowers* small, white. *Calyx* cup-form, entire, permanent, and enlarging with the fruit. *Petals* three; one, two, or all three half two-cleft; *divisions* linear, spreading. *Nectary*, a bifid, filiform, yellow body, rising from the inside of the base of each division of the petals. *Filaments* three, short, standing between the nectaries, inserted into the petals below their fissures. *Anthers* oblong. *Germ* superior, ovate, one-celled, containing one *ovulum* attached to the bottom of the cell. *Style* length of the corol. *Stigma* simple. *Drupe* or berry globular, three-fourths covered with the enlarged calyx, yellow, pulpy, one-celled. Birds are fond of them. *Seed* single, globular. *Integuments* two; *exterior* nuciform; *inner* one white and spongy. *Perisperm* conform to the seed, amygdaline. *Embryo* inverse, minute, lodged in the apex of the perisperm. *Cotyledons* two, equal, minute, semi-linear. *Radicle* larger than the cotyledons, oval, superior.

2. O. *imbricata. R.*

Shrubby, scandent. *Leaves* bifarious, from ovate-lanceolate to oblong, entire, glossy. *Racemes* axillary, before the flower expands bifariously imbricated, (like the spiculæ in *Briza.*) *Drupes* ovate.

A very large climbing shrub, or tree, if any scandant plant can be so called; a native of Chittagong, where it flowers in the hot season.

LOEFLINGIA. Schreb. gen. N. 71.

Calyx five-leaved. *Corol* five-petalled. *Capsules* superior, one-celled, three-valved. I.

1. L. *indica. Linn. sp. pl. ed. Willd.* 1. 191. *Retz. Obs.* 48. 165

Annual, diffuse, branchy. *Leaves* sub-verticelled, cuneiform. *Flowers* terminal. *Style* three-cleft. *Calyx* fleshy.

Pharnaceum depressum. *Mant.* 564.

A small, diffuse, annual plant; appearing and flowering in the cold season.

Stems many, pressing on the ground, branchy. *Leaves* opposite sessile, with many smaller ones from their axills, which makes them appear verticelled, oval, smooth, from a quarter to half an inch long. *Stipules* four-fold, membranaceous, with many small similar scales about the flowers. *Flowers* sessile in the divisions of the *branches*, and terminal. *Petals* linear, with three or four-toothed apices.

HIPPOCRATEA. Schreb. gen. N. 73.

Calyx five-parted. *Petals* five. *Germ* three-celled; *ovula* a few, attached to the axis. *Capsules* three, one-celled, two-valved. *Seeds* membrane-winged. *Embryo* erect, without perisperm.

1. H. *indica. Linn. sp. pl. ed. Willd.* 1. 193. *Corom. pl.* 2. *N.* 130.

Shrubby, climbing by tendrils. *Leaves* oblong, ventricose, serrate. *Corymbs* axillary. *Capsules* oblong, two-seeded.

A large, climbing shrub, a native of forests, hills, and wild uninhabited places, over various parts of India. Flowers about the beginning of the hot season.

Tendrils simple, woody. *Leaves* opposite, short-petioled, oval, pointed, serrate, smooth, shining, about two inches long. *Panicles (Umbells)* axillary, opposite, peduncled, about as long as the leaves, dichotomous, expanding. *Flowers* numerous, very small, of a rusty yellow

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colour. *Bractes* minute. *Petals* linear-oblong. *Germ* superior, three-lobed, three-celled, with two *ovula* in each, attached to the axis. *Style* shorter than the stamens. *Capsules* from one to three, oblong, one-celled, one-valved. *Seeds* two, broad-winged, affixed to the bottom of the capsules by the apex of the wing.

2. H. *obtusifolia. R.*

Shrubby, climbing by the help of cirrhose branchlets. *Leaves* elliptically-oblong, entire, obtuse. *Corymbs* terminal and axillary. *Capsules* obovate, four-seeded.

A native of the coast of Coromandel. Flowering time in the Botanic garden, March and April ; the seeds take one year to ripen.

Stems and larger *branches* ligneous, and covered with cracked, spongy grey *bark*, climbing to a great extent by the help of the smaller, round, smooth, diverging, opposite branchlets, which take a turn or two round their supporters. *Leaves* opposite, short-petioled, oblong, entire, (large luxuriant leaves are sometimes obscurely serrate,) obtuse, firm, polished; length from three to four inches. *Stipules* of the leaves four-fold, minute, subulate ; those of the branchlets larger. *Corymbs* terminal, or from the exterior axills, often compoundly dichotomous, and shorter than the leaves *Bractes* minute, ovate. *Flowers* small, pale greenish yellow. *Calyx* five-leaved. *Petals* five, ovate-lanceolate. *Nectary*, a large, fleshy receptacle receiving the base of the germ ; its margin becomes thin, and is divided into three, tapering, antheriferous segments, which are at first erect, but soon become revolute. *Filaments* no other than the three segments of the nectary. *Anthers* two, round, one-celled lobes. *Germ* three-lobed, immersed in the thick, fleshy nectary, three-celled, each cell containing several seeds, attached to the axis. *Style* the length of the filaments ; *stigma* three-toothed. *Capsules* three, obovate, thin, smooth, slightly veined, about two inches long, by one and a half broad, one-celled, two-valved. *Seeds* generally four in each capsule, two on each side, lodged about its middle, of a narrow-oblong shape, with a large, oblong, membranaceous wing proceeding from the base, and attached by its extremity to the very base of the capsule. *Integuments* two; *exterior* a very thin, smooth membrane; *interior* rather thick and somewhat spongy. *Perisperm* none. *Embryo* erect. *Cotyledons* oblong, pale green while recent. *Plumula* two-leaved. *Radicle* short, inferior.

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Obs. In the following species there are only two seeds in the capsule, in every other respect it resembles exactly this species.

3. H. *arborea. R.*

Sub-arboreous, with climbing branches. *Leaves* opposite, oblong, serrulate, cuspidate. *Corymbs* axillary. *Capsules* linear-oblong, two-seeded.

B. Katha-paharia.

A native of the interior parts of India. It blossoms in July, and the seeds ripen in March.

Trunk tolerably straight, but short, about as thick as a man's thigh, covered with smooth, dark brownish ash-coloured bark. *Branches* and *branchlets* spreading and climbing to a great extent, young shoots round and smooth, indeed highly polished; many of them form the claspers. *Leaves* opposite, short-petioled, drooping, oblong, taper-pointed, serrate, very smooth on both sides ; from six to seven inches long, and about three broad. *Stipules* none, but two or three small, dark brown, scaly gems are found in each axill. *Corymbs* axillary, dichotomous, with a pedicelled flower in the divisions. *Bractes* opposite, small, permanent. *Flowers* very numerous and small, pale greenish yellow. *Calyx* beneath, generally four, though sometimes five or even six-parted ; *divisions* rounded, and only about half the length of the corol. *Corol* four, five, or six-petalled, (six is the most common, and I suppose the natural number,) in a double series, equal, ovate-oblong, smooth. *Nectary* a three-sided, fleshy cup surrounding the insertion of the stamens and germ. *Filaments* three, membranaceous, shorter than the corol. *Anthers* four-lobed. *Germ* ovate. *Style* short. *Stigma* simple. *Capsules* three, cuneiform, striated, three inches long, and about one and a half broad, one-celled, two-valved; *valves* exactly boat-shaped. *Seeds* two, ovate, compressed, enlarged with an oblong, soft, thin, spongy wing, the attachment is between its apex and the base of the capsules. *Integument* single, ochraceous. *Perisperm* none. *Embryo* oblique, compressed. *Cotyledons* conform to the seed, yellow. *Plumula* two-lobed. *Radicle* oval, sub-inferior.

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JOHNIA. R.

Calyx inferior, five-leaved, or five-parted. *Corol* five-petalled. *Nectary* or receptacle of the stamina and pistillum sub-globular. *Germ* three-celled ; *ovula* one or two in each cell, peltate. *Berry* one or more-seeded. *Embryo* without perisperm, direction various.

In honour of the Rev. Dr. John of Tranquebar. It is nearly allied to *Salacia. Gen. pl. ed. Schreb.* 1380. Its proper place is probably the third order of this class.

1. J. *salacioides. R.*

Leaves opposite, broad-lanceolate, entire, firm and polished. *Calyx* five-leaved. *Petals* sessile. *Anthers* sessile on the three divisions of the nectary.

A native of Tipperah, Chittagong, and other parts of the eastern frontier of Bengal. It flowers in the Botanic garden during the hot season, and the fruit ripens about the close of the rains.

A large, very ramous shrub, with its *branches* spreading much, and often drooping elegantly. *Bark* of the ligneous parts brownish and somewhat scabrous, that of the young twigs smooth.

Leaves opposite, short-petioled, recurved, broad-lanceolate, entire, firm, polished, obtuse-

pointed; about four inches long, and half as much broad. *Stipules* minute, caducous. *Peduncles* axillary, several, longer than the petioles, one-flowered. *Flowers* small, deep greenish orange colour. *Calyx* of five round, villous margined, minute leaflets. *Petals* round, sessile, with the margins recurved. *Filaments* no other than the three, short, triangular segments of the fleshy urceolate nectary, elevating the three, large, twin *anther* even with the stigma. *Germ* above, conical; three-celled, with two ovula in each, attached to the axis. *Style* scarcely any; *stigma* acute. *Berry* size of a crab apple, round, smooth, dull-red. *Pulp* in considerable quantity, white, of a soft, tough, gelatinous consistence, and eaten by the natives. *Seeds* two, or three, separated by a thick partition of pulp; transversely oblong; flat on the inside, convex on the exterior. *Integuments* single, spongy, brown. *Perisperm* none. *Embryo* consisting of two equal *cotyledons,* conform to the seed, and until vegetation begins, so firmly, and closely united, that they seem to be of one entire piece. *Radicle* small, lodged at the umbilicus, relative, centripetal. I. 169

2. J. *coromandeliana. R.*

Leaves opposite, serrulate, polished. *Calyx* five-toothed. *Petals* unguiculate.

A small, straggling tree, or rather a large climbing shrub, a native of forests and mountains of Coromandel.

Leaves opposite, short-petioled, oval, smooth, shining, sometimes most slightly serrulate; about three inches long, and one and a half broad. *Peduncles* axillary, several, bowing, one-flowered. *Calyx* inferior, one-leaved, five-cleft. *Petals* five, clawed, round, or oval, spreading. *Nectary* a large globular, fleshy receptacle, elevating the stamens and pistil. *Filaments* three, spreading, shorter than the petals, inserted into the top of the nectary round the germ. *Anthers* small, twin. *Germ* half immersed in the nectary, three-celled, with one or two ovula in each, attached to the axis. *Style* very short. *Stigma* simple. *Berry* superior, globular, upon the remaining nectary, or receptacle, size and colour of a small red cherry; one-celled, one-seeded.

IRIS. Schreb. gen. N. 97.

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Corol six-petalled, petals unequal, alternate, jointed and spreading. *Stigmas (petals,)* from cowled to bilabiate.

1. I. *chinensis. Curtis's Bot. Mag. N.* 373.

Root creeping. *Leaves* ensiform, drooping; *scape* ramous, many-flowered.

This elegant species has been introduced from China into the Botanic garden, where it thrives best in cool, moist, shady situations. Flowering time the beginning of the hot season, viz. March and April.

MOREA. Schreb. gen. N. 80.

Corol six-petalled; the three inner spreading and narrower. *Stigma* three-cleft.

1. M. *chinensis. Linn. sp. pl. ed. Willd.* 245. *Thunb. Diss. N.* 19.

Herbaceous, stems compressed. *Leaves* bifarious, ensiform. *Umbels* terminal, proliferous, all six-petals expanding.

Belameanda-shular mini. *Rheed. Mal.* 11. *t.* 37.

Ixia chinensis. *Curt. Magaz.* 171.

Pardanthus chinensis. *Annals of Bot.* 1. 416.

*Beng. Dus*baha, or *Dus*bichundi.

A native of India, China, &c. *Flowers* in the rainy season in the Botanic garden near Calcutta.

Is common in gardens over India, where it blossoms during the rains, and ripens its seeds in the cold season.

COMMELINA. Schreb. gen. N. 86.

Calyx inferior, three-leaved. *Corol* three-petalled, often dissimilar. *Nectaries* or *sterile* filaments three, with a cruciform head. *Capsules* two or three-celled. *Seeds* one or more. *Embryo* simple, and furnished with a perisperm. I. 171

1. C. *communis. Linn. sp. pl. ed. Willd.* 1. 249.

Polygamous, creeping. *Leaves* ovate-lanceolate, smooth; *spathes* many-flowered. *Petals* unequal. *Anthers* dissimilar. *Capsules* tricoccous.

Beng. Juta-kanshira.

Ephemerum dipetalum. *Kempf. amœn. p.* 888. *t.* 889.

This species is common over the low moist parts of India; flowering time the rainy season chiefly.

Root fibrous. *Stems* numerous, creeping, dichotomous, jointed, round, smooth; length very various. *Leaves* alternate, sessile on tubular, vaginated sheaths, ovate-lanceolate, acute; margins waved; smooth on both sides, with delicate, parallel veins running lengthways on the under side; from two to four inches long; mouths of the sheathing petioles a little ciliate. *Spathes* terminal, or sub-fascicled, semi-cordate.

2. C. *bengalensis. sp. pl. ed. Willd.* 1. 250.

Polygamous, creeping. *Leaves* cordate. *Spathes* three-flowered. *Petals* unequal. *Anthers* dissimilar. *Capsules* three-celled, six-seeded.

Ephemerum bengalense, &c. *Pluck.* 1. 27. *f.* 3.

Beng. Kanshira, also Kanuraka.

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Like the last described, this species is a native of wet places over Bengal, but much scarcer and smaller; flowering time the same.

Stems creeping, dichotomous, jointed, hairy. *Leaves* alternate, petioled, cordate, nervous, a little hairy, about an inch long and three-fourths of an inch broad. *Petioles* sheathing, hairy, and ciliate. *Spathes* terminal, and axillary, of a shape between that of a short, inverted cone and falcate; open on the upper side only; each containing a common peduncle
I. of two hermaphrodite flowers, and a long peduncled male one. *Flowers* small, bright blue
172 colour. *Calyx* as in the former. *Corol* three-petalled; two of them larger, and long-clawed, as in the former species, the third small, and sessile, but coloured. *Nectary, stamens* and *pistil* as in C. *communis*, only the style is here beautifully spiral. *Pericarp* three-celled, three-valved, with generally two seeds in each cell.

3. C. *moluccana. R.*

Annual, creeping. *Leaves* sessile, oblong, about five-nerved. *Flowers* terminal, solitary, sub-sessile. *Petals* equal.

A native of the Moluccas. Compare with Vahl's C. *attenuata.*

4. C. *salicifolia. R.*

Polygamous, creeping. *Leaves* narrow-lanceolate. *Petals* three, equal. *Spathes* from four to six-flowered. *Anthers* dissimilar. *Capsules* pointed, three-celled, six-seeded.

Sans. Langulee.

Beng. Panee-kanshira.

Found with the former in wet places near Calcutta, it is also a native of the Coromandel coast; flowering time the wet season.

Stems creeping to a great extent, ramous, round, smooth, jointed, very succulent. *Leaves* alternate, sessile on their cylindric sheaths, narrow-lanceolar, a little hispid on the upper side and margins, when the finger is drawn backward; from four to six inches long, and not quite one inch broad. *Sheaths* cylindric, striated; mouth ciliate. *Spathes* leaf-opposed, long-peduncled, semi-cordate, long-pointed. *Flowers* hermaphrodite, and male; large, of a beautiful deep azure colour, disposed as in the former species, only there are fewer to the common shorter peduncle, and often two on the longer one. *Calyx* as in the former. *Petals* three,
I. equal, except that the lower one having a shorter claw is nearly sessile. *Nectaries, stamens,*
173 and *pistilum*, as in the former. *Capsules* oblong, pointed, three-celled, three-valved, with two seeds in each. Cattle are fond of this species.

5. C. *nana. R.*

Creeping. *Leaves* cordate-lanceolate, stem-clasping. *Flowers* terminal, sub-panicled. *Petals* equal. *Capsules* three-celled, many-seeded.

A native of wet places over India; it appears during the rainy and cold season.

Root annual. *Stems* or branches creeping, enveloped in the sheaths of the leaves; from three to six inches long. *Leaves* stem-clasping, sheathing, linear-cordate, somewhat ciliate, and waved; *sheaths* a little downy. *Flowers* terminal, sub-panicled, small, bright blue. *Calyx* equal, permanent. *Corol* of three, roundish, equal petals. *Nectarial* filaments as in the other Indian species, but naked. Filaments three, from the middle downwards clothed with hairs, converging over the stigma. *Anthers* blue. *Style* shorter than the stamens, straight and tapering. *Capsules* three-celled, with from three to six seeds in each.

Obs. Were the style longer, or even spirally bent, I should have concluded this plant to be *Commelina spirata. Mant.* 2. *p.* 176. Burman's figure of his C. *diffusa. Flor. Ind. tab.* 7. *f.* 2. is so bad that no comparison can be made; they may be the same.

6. C. *nudiflora. Linn. sp. pl. ed. Willd.* 1. 252.

Frequently creeping. *Leaves* linear, sessile, sheathing. *Flowers* terminal, racemed, diandrous. *Petals* equal. *Capsules* three-celled; *cells* two-seeded.

Beng. Kanduli.

Tali-pullu. *Rheed. Mal.* 9. *p.* 123. *t.* 63.

Tradescantia malabarica. *sp. pl.* 412.

I. A native of most of the warmer humid parts of India. Flowering time the rainy season.
174 *Stems* none, but it has many short, creeping, smooth, jointed *branches*, with their flower-bearing extremities sub-erect. *Leaves* alternate, sessile, linear, sheathing, smooth, excepting a few fine hairs about the mouths of the sheath. *Racemes* terminal, long-peduncled, corymbed, bearing on their upper side many small blue flowers in succession. *Bractes* solitary, one-flowered, concave, caducous. *Calyx* three-leaved, equal. *Corol* of three, obovate, equal, blue petals. *Nectarial filaments* with a very few, moniliform, blue hairs; corpuscles two, clavate. *Filaments* three, two of them ascending, larger, and thicker, well clothed with beautiful jointed blue hairs. *Anthers* blue, oval, the third filament sterile. *Style* short, ascending. *Capsules* three-celled, with two scabrous seeds in each.

7. C. *cespitosa. R.*

Polygamous, creeping. *Leaves* lanceolate. *Spathe* cordate, peduncled, few-flowered; *petals* nearly equal. *Capsules* three-celled, with one or two seeds in each.

A native of Chittagong, from thence the plants were sent to the Botanic garden by Mr. W. Roxburgh. It is in blossom most part of the year.

Stems and *branches* numerous, slender, smooth, jointed, creeping close over a space of some feet and striking deep root at the joints. *Leaves* alternate; sessile on their smooth cylindric sheaths, ovate-lanceolate, the upper ones narrower and longer; all are entire, and smooth on both sides. *Sheaths*, besides the usual leaf-bearing one, there is a second or inner annular one wherever there is a peduncle. *Peduncles* solitary, leaf-opposed, about an inch long, round, and smooth. *Spathe* cordate, or rather semi-cordate, in their natural folded state,

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each embracing two common pedicels; the superior one bearing two, three, or four, pedicelled male flowers; and the lower about as many hermaphrodite ones; all blossoming in succession. *Calyx* of three, equal, obovate, concave, pale blue, pellucid leaflets. *Petals* three; the upper two reniform and pedicelled; the lower one cordate, and sub-sessile, all of a most beautiful light blue colour. *Nectaries* three, erect, on the upper side opposite to the stamens. *Filaments* three, equal, ascending. *Anthers*, the middle one larger and sagittate. *Germ* ovate. (in the male flowers wanting.) *Style* ascending, as long as the stamens. *Stigma* incurved, simple. *Capsules* oblong, three-celled, with one or two seeds in each.

8. C. *scapiflora. R.*

Root perennial. *Racemes* radical, erect, with alternate, many-flowered spathes. *Petals* equal. *Leaves* in a tuft, ensiform.

Beng. Kurelli.

A native of Hindoostan and introduced into the Botanic garden by Colonel Hardwicke, where it blossoms in March and April, at which time the plant is destitute of leaves, nothing being seen but the racemes ornamented with large lively blue flowers round the apex.

Root perennial, composed of several, smooth, elongated tubers, with a few filiform radicles. *Stems* none, except the sheathing bases of the leaves which appear a month or two after the flowers; these are ensiform, waved, acute, smooth, and marked with several straight veins; length from four to eight inches, breadth one. *Racemes* radical, erect, straight, smooth, invested at each of the remote two or three joints, with a small, solitary sheath; these sheaths towards the top are more approximated, each of them there embracing the insertion of a branchlet which bears several pedicelled flowers. *Calyx* the three leaflets thereof broad-lanceolate, and considerably shorter than the corol. *Petals* equal, round, concave. *Nectaries* alternate with the stamens, hairy. *Filaments* three, alternate with the petals, longer than the filaments of the nectaries, and like them hairy about the middle. *Anthers* blue. *Pistil* declining. *Stigma* minutely three-toothed.

9. C. *herbacea. R.* I. 176

Herbaceous. *Stems* jointed, ascending. *Leaves* lanceolate. *Panicles* terminal. *Petals* equal. *Capsules* three-celled, many-seeded.

A native of Sumatra, from thence introduced into the Botanic garden by Mr. Charles Campbell, where it blossoms and ripens its seeds during the whole year.

Root perennial, consisting of long, firm, thick fleshy fibres. *Stems* several from the same root, herbaceous, jointed, ascending, round, smooth, much swelled at the joints, from two to three feet in height, nearly the whole enveloped in the sheath of the leaves. *Leaves* alternate, sessile on their sheaths, lanceolate, smooth, slightly marked with five parallel nerves, margins entire, waved, somewhat membranaceous, and coloured. *Sheaths* shorter than the joints, striated, and smooth, except a few white hairs round their mouths. *Panicles* terminal; there are also smaller ones from the superior axills, which are sub-globular, and smaller. *Ramifications* alternate, at first divaricate, afterwards recurved. *Flowers* numerous, small, short-pedicelled. *Bractes* triangular, acute. *Calyx*, leaflets three, equal, oblong, concave, spreading, fleshy, furrowed on the outside. *Petals* three, equal, oval, much larger than the calyx, concave, entire, spreading and of a delicate translucent pale bluish white. *Nectarial* filaments alternate with the longer stamina, bearded (like the latter) towards the base, with delicate, slight blue hairs, and crowned with large incumbent, three-lobed, yellow glands. *Germ* somewhat three-sided. *Style* oblique, length of the filaments. *Stigma* small, crowned with a tuft of hairs. *Capsules* three-celled, three-valved, with generally from four to six, or seven, angular, rough seeds in each cell. *Embryo* lodged in a deep pit, in the back of the seed, small, oval.

SONERILA. R.

Calyx superior, three-toothed. *Petals* three on the mouth of the calyx, alternate with the stamina. *Germ* three-celled, cells many-seeded, attachment central. *Capsule* three-celled. *Seeds* numerous, minute. I. 177

1. S. *maculata. Roxb.*

Leaves opposite, unequally-cordate, bristle-spotted, serrulate, ciliate.

Soneri-ila. *Rheed. Mal.* 9. *p.* 127. *t.* 65.

Sootli, the vernacular name in the Khassee language.

It is indigenous amongst the mountains on the north-east border of Bengal, and used by the natives as a potherb. Flowering time the beginning of the rains. In its natural character it agrees very exactly with *Burmannia.*

Root fibrous. *Stem* short, being only a few inches high, and when old leaning much; *branches* opposite, longer than the stem, the lower reclinate, with their apices resting on the ground and striking root, all are nearly round and bristly; height of the whole plant from six to twelve inches. *Leaves* opposite, long-petioled, more or less unequally broad ovate-cordate, nerved, bristle-serrulate, pointed, surface bullate, and marked with numerous small white specks from the centre of each rises a slender subulate bristle; veins and nerves bristly. From two to six inches long, by from one to three broad. *Racemes* axillary, spiral, their peduncles as long as the petioles, deeply coloured and hairy. *Flowers* springing from the upper convex side of the raceme, shortly pedicelled, red, bracteate. *Bract* subulate, minute. *Calyx* superior, three-sided, and tubular; mouth three-toothed, permanent. *Petals* three, lanceolar, inserted into the mouth of the calyx, alternate with its segments, smooth on the inside, on the outside are frequently found some slender bristles. *Nectary* of three, laciniated

Page Carey Ed. scales round the base of the style. *Filaments* three, alternate with the petals, and about their length. *Anthers* sagittate, one-third as long as the filaments, until the flower has been expanded some time they are inverted within the tube of the calyx, afterwards erect. *Germ* clavate, three-sided, three-celled; *ovula* numerous, attached to their respective receptacles, I. rising from the axis, exactly as in *Osbeckia chinensis. Gært. Carp.* 2. *t.* 126. *Style* length 178 of the stamens. *Stigma* simple. *Capsules* erect, three-sided, clavate; pedicel included, about half an inch long, three-celled, opening at the apex. *Seeds* very numerous, and too minute to admit of my ascertaining their internal structure.

2. S. *emaculata. Roxb.*

Leaves opposite, unequally narrow-cordate, acute, bristly, but void of spots, serrulate, ciliate.

A native of the Khassee mountains on the north-east border of Bengal, where it flowers in July, and differs from the preceding species, in the leaves being destitute of the little round white spots, into which the bristles are inserted, (viz. one in the centre of each spot.) It is also less robust than that plant, with longer peducles to the racemes, which are sometimes leaflet-bracted at the middle.

The flowers and seed vessels are alike.

3. S. *angustifolia. Roxb.*

Leaves opposite, unequally oblong-lanceolar, serrulate, hairy.

A native of the mountains on the north-east border of Bengal, and like the two former species in habit, but the shape of the leaves widely different, and only a little hairy.

4. S. *moluccana. R.*

Sub-caulescent. *Leaves* in pairs, entire, hairy, one minute and nearly round, the other unequally cordate. *Racemes* umbelled.

A native of the Molucca Islands.

XYRIS. Schreb. gen. N. 89.

Head with roundish one-flowered scales. *Perianth* beneath, three-leaved. *Corol* three-petalled, equal, waved. *Nectaries* three, bifid. *Capsule* one-celled, three-valved. *Seeds* nu- I. merous, on parietal receptacles.

179 1. X. *indica. Linn. sp. pl. ed. Willd.* 1. 254.

Leaves ensiform. *Heads* globular; *scales* round.

Kotsjiletti-pullu. *Rheed. Mal.* 9. *p.* 139. *t.* 71.

Beng. Cheena ghauza. Dabi dooba.

Grows on a low clayey soil, over many parts of Coromandel, and Bengal. Flowering time November and December. Seeds ripen in January and February.

Root fibrous, annual. *Leaves* radical, bifarious, straight, sword-shaped, on one edge slit into a sheath for the scape, pointed, smooth; from six to twelve inches long. *Scape* naked, round, striated, erect, length of the leaves, each supporting a round, flower-bearing head. *Flowers* a beautiful bright yellow. *Bractes*, or scales one-flowered, orbicular, concave, hard, smooth. *Calyx* three-leaved, hid within the scale, membranous. *Petals* three, each supported on an unguis just long enough to raise their expanding, oval, crenate borders above the scales. *Nectary*, three filaments inserted, alternately with the petals, round the base of the germ; apex two-cleft, each division ending in a pencil of fine yellow hairs; adhering firmly at the cleft to the edges of the petals, near the apex of the claws. *Filaments* three, short, broad, erect, inserted on the inside of the apex of the claws of the petals. *Anthers* twin, erect, united by a continuation of the filament. *Germ* superior, three-sided. *Style* length of the claws of the petals, from thence three-cleft. *Stigma* torn. *Capsule* three-valved, one-celled. *Seeds* numerous, attached to a heel down the inside of each valve.

Obs. The following account of the virtues of this plant I have been favoured with, by the Honourable John Hyde, who informs me that "the natives of Bengal esteem it a plant of great value, because they think it an easy, speedy, and certain cure for the troublesome irruption called ring worms." This accords with what Van Rheede says of it, at page 139 of the 9th volume of the *Hortus Malabaricus*, viz. *Foliorum succus cum aceto mixtus impetigini resistit. Folia cum radice oleo incocta contra lepram sumuntur.*

I. 180

FUIRENA. Schreb. gen. N. 90.

Ament imbricated on all sides with tailed scales. *Corol* three-petalled. *Seed* naked.

1. F. *ciliaris. R.*

Culms erect, about twelve inches, columnar, jointed, leafy. *Leaves* hairy. *Heads* axillary and terminal. *Scales* very hairy. *Stigmas* three. *Seeds* three-sided.

Scirpus *ciliaris. Linn. sp. pl. ed. Willd.* 1. 309. *Rottb. gram.* 5. *t.* 17. *f.* 1.

Teling. Elagabora gaddi.

A native of moist places on the coast of Coromandel, with the *Scirpi*, &c.

Root fibrous. *Culms* nearly erect, about a foot high, round, striated, leafy, jointed, but not piped. *Leaves* sheathing, shorter than the culms, hairy, ciliated on the margin, concave on the inside, not keeled. *Heads* sub-globular, compound, axillary, and terminal, the terminal one is considerably longer, they are composed of several oval, imbricated, many-flowered, sessile spikes. *Involucre* of the terminal head one or at most two small leaves; of the others, nothing more than the sheath of the leaf from whence they issue. *Scales* of the aments, or spikes, *corol*, &c. as in the genus.

KYLLINGIA. Schreb. gen. N. 9.

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Ament imbricated. *Flowers* with *calyx* and *corol* of two chaffy valves each. *Seed* one.

1. K. *monocephala. Linn. sp. pl. ed. Willd.* 1. 256. *Vahl. in pl.* 2. 379.

Rottb. gram. 13. *t.* 4. *f.* 4.

Culms six to eighteen inches high, triangular; *head* terminal, single; *involucres* three or four. *Seeds* obcordate, without angles. I. 181

Pee-Mottenga. *Rheed. Mal.* 12. *p.* 99. *t.* 53.

Gramen capitatum. *Rumph. Amb.* 6. *p.* 8. *t.* 8. *f.* 2.

Beng. Sweta gothoobi; Nirbishee, its fragrant aromatic root being accounted an antidote to poisons.

Common over India on low shady pasture ground, when totally shaded the heads are generally more green, which is rather uncommon.

Root fibrous, and stoloniferous. *Culms* erect, from six to eighteen inches high, generally about eight; three-sided, smooth, naked except near the base; *angles* sharp, and sides hollowed. *Leaves* sheathing, as long as the culm, smooth, sharp keeled. *Head* terminal, sessile oval, generally white. *Involucre* three-leaved, unequal, the largest leaf as long as the culm. Back of the glumes of the corol hispid. *Stamens* three. *Stigma* three-cleft. *Seed* obliquely obcordate, much compressed, smooth, light brown.

2. K. *triceps. Linn. sp. pl. ed. Willd.* 1. 256.

Culms from six to twelve inches high, three-cornered. *Heads* terminal, sessile, from three to six; *involucres* three or four; *florets* diandrous. *Seed* oblong, without angles.

Mottenga. *Rheed. Hort. Mal.* 12. *p.* 97. *t.* 52.

A native of low shady pasture ground.

Root somewhat tuberous, with capillary fibres. *Culms* straight, from six to twelve inches high, smooth, naked, except at the base, obtusely three-sided; *angles* rounded. *Leaves* sheathing, nearly as long as the culm, smooth. *Head* terminal, composed of from three to six sessile, oval, white spikes, the largest one is in the centre, the rest in the circumference. *Involucre* as in K. *monocephala*. *Stamens* seldom more than two. *Stigma* two-cleft. *Seed* oblong, much compressed, white, no angles.

Obs. It differs from K. *monocephala* not only in having a compound head but in being diandrous, with a bifid style, and oblong lanceolate seed. I have found luxuriant plants with more than one flower in the calyx. I. 182

3. K. *umbellata. Linn. sp. pl. ed. Willd.* 1. 257. *Rottb. gram.* 15. *t.* 4. *f.* 2.

Culms from one to two feet high, three-sided, umbel of sessile and peduncled, cylindrical, ragged spikes, involucres many; involucels none. *Seeds* three-sided, linear-oblong.

Kolpullu. *Rheed. Hort. Mal.* 12. *t.* 63.

Mariscus *umbellatus. Vahl. Enum. pl.* 2. 376.

Beng. Bura-gothoobi.

A native of wet or marshy places.

Root tuberous, rust-coloured, with rust-coloured fibres. *Culms* erect, from one to two feet high, three-fourths naked, three-sided, smooth. *Leaves* sheathing, nearly as long as the culm. *Umbel* terminal, sessile, composed of sessile, and peduncled, cylindrical spikes of numerous diverging flowers. *Involucre; universal,* many leaved, unequal; the largest leaf often as long as the culm; *partial,* none. *Calyx* and *corol,* &c. as in the genus. *Seeds* three-sided.

Obs. As this plant wants the partial involucre it may be K. *sumatrensis* of Retzius.

4. K. *cyperoides. R.*

Culms from six to eight inches high, three-sided. *Umbel* compound, consisting of globular heads of numerous spikelets, *involucre* three-leaved. *Seeds* oblong, three-sided.

An elegant cyperus-looking small species, a native of moist pasture ground.

Root fibrous. *Culms* erect, two-thirds naked from six to eight inches high, three-sided, smooth. *Leaves* sheathing, as long as the culm. *Involucre; universal,* three-leaved, very unequal, the largest leaf being as long as the culm, and the smallest one inch; *partial,* minute. *Calyx, corol,* &c. as in the genus, excepting that there are sometimes two flowers in the same calyx.

TUNGA. R.

I. 183

Ament ovate, imbricated on all sides. *Calyx* one-valved, one-flowered. *Corol* two-valved. *Seed* naked.

The plants which come under definition I cannot by any means reconcile to the character of *Schœnus,* nor indeed to any genus known to me. I have therefore constituted a new one of them, under the Telinga name *Tunga,* which is applied to the whole family of *Calamariæ.* Linn. *Cyperoideæ.* Juss. This genus is probably the same as Vahl's *Hypaelyptum.*

1. T. *triceps. R.*

Culms from four to eight inches high, a little compressed; *spikes* two or three, terminal; *involucre* two-leaved.

A native of Coromandel, growing with other *cyperi.*

Root fibrous. *Culms* erect, mostly naked, from four to eight inches high, a little compressed, smooth. *Leaves* sheathing, broad, nearly as long as the culm. *Spikes* terminal, generally three, sessile, oval, imbricated with innumerable small rust-coloured flowers. *Involucre* two-leaved, the largest is often erect, and looks like a continuation of the culm, it is

Page Carey Ed. from two to three inches long; besides these there are two or more oval, lateral, scales. *Calyx*, a scale, single, nearly as in the *scirpi*, one-flowered, wedge-shaped, striated. *Corol* two-valved, membranaceous, shorter than the scale. *Stamens* three. *Stigma* three-cleft. *Seed* oblong, three-sided without bristles.

2. T. *lævigata. R.*

Culms from one to two feet high, three-sided. *Spikes* several, terminal. *Involucre* three-leaved.

A native of moist vallies.

Root fibrous. *Culms* erect, from one to two feet high, nearly naked, three-sided, smooth. I. 184 *Leaves* numerous, sheathing half as long as the culm. *Head* terminal, generally composed of about seven oval, sessile, closely imbricated spikes. *Involucre* two or three-leaved, very unequal, the largest from five to eight inches, the shortest one, or one and a half. *Calyx* as in T. *triceps*, only sometimes three-lobed at the apex. The rest as in T. *triceps*.

3. T. *diandra. R.*

Culms leafy, two or more feet high, three-sided; *corymbs* terminal; *involucres* alternate. *Flowers* diandrous. *Style* two-cleft.

A stout, erect, smooth, long-leaved species; a native of Amboyna.

Culm jointed, three-sided, smooth. *Leaves* one at each joint, sheathing, rising much higher than the culm, linear, smooth, acute, three-nerved, about three feet long. *Corymbs* terminal, decompound or more. *Involucres* several, the largest at the first division of the corymbs, and like the leaves of the culm, but smaller; *spikelets* oval, minute, composed of many small brown imbricated flowers as in the *scripi*. *Calyx*, a glume, roundish, smooth. *Corol*; the two valves, small, placed transversely with respect to the calyx, and smaller than it. *Filaments* two, one rising laterally from the bosom of each valve of the *corol*; *anthers* linear. *Germ* oblong; *style* deeply two-cleft. *Seed* oval, rather longer than the calyx.

SCHŒNUS. Schreb. gen. N. 92.

Calyx, or *Corol*, *glumes* several; *seed* one, naked.

1. S. *articulatus. R.*

Culms three-sided, erect, from four to five feet high, jointed, leafy. *Corymbs* terminal and axillary, compound and decompound. *Style* undivided. *Seed* obovate, beset with bristles, and crowned with the conic base of the *style*.

I. 185 *Teling.* Konda-tunga.

A native of marshy places up amongst the Circar mountains. It may be referred to Vahl's *Rynchospora enum. pl.* 2. 229.

Culms erect, three-sided, leafy, jointed, smooth, from four to five feet high, angles sharp, between the joints fistulous. *Leaves* of the root as long as the culm, smooth, except that the margins are a little hispid, slender considering their great length, those of the culm from five to eight, sheathing, shorter than those of the root. *Umbels* the terminal one decompound, those only from the exterior axills compound. *Involucre* of the terminal umbel, from three to four-leaved, about as long as the umbel, leaf-like; the axillary umbels have no involucre, or, at most, a very trifling one. *Flowers* sub-solitary, chesnut-coloured. *Calyx* none. *Corol*; *petals* four. *Style* undivided, with a permanent conical base. *Stigma* entire, acute. *Bristles*, six permanent ones surrounding the germ. *Seed* a little compressed, crowned with a large brown, spongy, conical body, the base of the style.

Obs. There is frequently a very slender male flower within the large or inner glume of the corol; it consists of one glume or scale, and three stamens. The plant is so very coarse that cattle will not eat it.

CYPERUS.

Glumes chaffy, bifariously imbricated. *Corol* none. *Seed* one, naked.

SECT. I. *with culumnar Culms.*

1. C. *setaceous. Linn. sp. pl. ed. Willd.* 1. 269. *Retz. Obs.* 5. *p.* 10. *Culms* setaceous, from two to three inches high; *spike* terminal, solitary, naked.

A native of Coromandel, appears and flowers during the rainy season chiefly.

I. 186 2. C. *mucronatus. Linn. sp. pl. ed. Willd.* 1. 273. *Retz. Obs.* 5. 10.

Culms from six to eight inches high, round, incurved, half-naked. *Spikes* lateral, sessile. *Involucre* one-leaved, besides the continuation of the culm. *Seed* oval, rounded.

A native of moist sandy places, over various parts of India.

Root creeping, invested in brown sheaths. *Culms* half naked, issuing singly from the root at some distance from each other, nearly round, ascending, from six to eight inches long; the lower half is involved in the sheath of a single, short leaf. *Leaf* sheathing, generally one to each culm, which is only about half its length. *Head* about an inch and a half below the extremity of the culm, it consists of five or six small, oval, ten or twelve-flowered spikes. *Involucre* one-leaved, about as long as the spikes; besides these there are some small, chaffy, calyx-like scales. *Seed* naked, oval, compressed, white.

3. C. *lateralis. Forst. descript.* 13. *N.* 28.

Culms erect, columnar, from eight to twelve inches long, naked; *head* of five or six sessile spikes beneath the straight apex of the culm; *stigma* bifid; *seed* oval, compressed.

A native of Coromandel.

Root creeping, dark rusty brown. *Culms* straight and perfectly erect, from eight to twelve inches high, round and naked. *Leaves* no other than a short sheath or two, embracing the base of each culm. *Spikes* sessile, five or six, forming a small head on one side of the culm about an inch and a half below its apex. *Involucre*, a minute, subulate leaflet immediately under the spikes, and of the same length with them. *Scales* of the spikes numerous, ovate-oblong, white, smooth and rather obtuse. *Stamina* three. *Stigma* bifid. *Seed* oval, flat on the inside, and convex on the exterior, lead-colour or grey, and smooth. Page Carey Ed.

Obs. This differs from the plant which I consider to be C. *mucronatus of Retz. fasc.* 5. *p.* 10. in being perfectly erect and destitute of foliage; whereas that species has leaves, is smaller, and always ascends in a curved direction; in that the scales of the spike are acute, in this obtuse, in other respects they are very much alike. At present I am inclined to think C. *mucronatus* of Vahl and Rottboel may be referred to this, consequently Willdenow's C. *mucronatus. sp. pl.* 1. 273. includes these two species. I. 187

4. C. *nudus. R.*

Culm from three to four feet high, round, naked, inwardly intercepted. *Leaves* none; *umbel* compound; *involucre* chaffy. *Stigma* three-cleft. *Seed* three-sided.

A native of stagnating, or slowly running sweet water over India.

Root perennial, fibrous. *Culms* erect, round, naked, articulated, smooth, from three to four feet high, above as thick as a common large quill. *Leaves* no other than a rusty coloured sheath or two embracing the base of each culm. *Umbel* terminal, generally compound, though sometimes decompound. *Involucre* several small, chaffy scales. *Umbellets* long, slender, peduncled, bowing, composed of from eight to twelve linear, sessile, rust-coloured spikes. *Involucels* like the involucres. *Seed* sub-linear, three-sided, smooth, light brown.

5. C. *semi-nudus. R.*

Culms from two to six feet high, round, tending to be angular at the top, naked. *Leaves* none. *Umbels* decompound, with an involucre half its height. *Stigma* three-cleft; *seed* three-sided.

Beng. Gola-methee.

Teling. Godoo tunga kooda.

This species is with the former a native of wet places.

Root perennial, creeping, fibrous. *Culms* erect, from two to six feet high, round, smooth, naked, except at the base, which is embraced by three or four sheaths. *Leaves* no other than the sheaths just mentioned. *Umbels* generally decompound, erect. *Involucre* three-leaved, equal, shorter than the umbel, sides and keel hispid. *Umbellets* and partial *umbellets* peduncled, composed of linear-lanceolate, yellowish spikes. *Seed* three-sided, smooth. I. 188

Obs. Cattle are not fond of it, and it is only eaten occasionally by buffaloes.

SECT. II. *with a three-sided Culm.*

6. C. *dubius. Rottb. gram.* 20. *t.* 4. *f.* 5. *Linn. sp. pl. ed. Willd.* 1. 273.

Culm from six to twelve inches high. *Head* terminal, roundish, sessile. *Involucre* of four or five long leaves, some of them longer than the culm.

Cyperus longus. *Rumph. Amb.* 6. *p.* 5. *t.* 2. *f.* 1.

C. *kyllingæoides. Vahl. enum. pl.* 2. 312.

Teling. Tagada tunga.

Beng. Chhota-gothoobi.

This species is much like *Kyllingia monocephala*, and is with it, a native of shady, moist pasture lands.

Root, a somewhat tuberous head, with many rust-coloured capillary fibres. *Culms* erect, from six to twelve inches high, three-sided, smooth, the lower third or fourth part involved in the sheaths of the leaves. *Leaves* sheathing, radical, embracing the base of the culm, very smooth, many of them longer than the culm. *Head* globular, size of a large cherry, composed of numerous, lanceolate, sessile, white-pointed spikes. *Involucre* four or five-leaved, unequal, some of them longer than the culm. *Seed* three-sided, pointed, dark rust-coloured, smooth.

Obs. Cattle eat it.

7. C. *monocephalus. R.*.

Culms from twelve to eighteen inches high, straight; *head* terminal, ovate, compound; *involucre*, from three to four-leaved; *spikelets* ovate. *Style* undivided. *Seed* three-sided, elevated on a spongy receptacle. I. 189

Beng. Gothoobi.

A native of low wet places over Bengal.

Root fibrous. *Culms* straight, three-sided, smooth, general height from twelve to eighteen inches. *Leaves* three, four, or five, investing with their sheaths, the lower parts of the culm straight and smooth, length various, the longest about as long as the culm. *Involucre, leaves* several, diverging, of very unequal lengths, the longest as long as the culm, and the shortest about an inch. *Heads* terminal, composed of a larger one in the centre, and four or five smaller ones in the circumference, all rigidly sessile. *Spikelets* ovate, incurved, ten or twelve-scaled, each spikelet embraced on the under side by an ovate-cordate, smooth, dark brown, bracte. *Scales* boat-shaped, pointed; *keel* greenish; *sides* deep, polished, chesnut colour. *Stamens* three. *Style* simple and undivided to the extremity. *Seed* three-sided, elevated on a spongy whitish receptacle.

Obs. The undivided style and spongy receptacle of the seed distinguish this from all the other species I have yet found in India.

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8. C. *diffusus. R.*

Diffuse, from two to four inches high. *Heads* terminal, glomerate, sessile; *spikelets* incurved. *Scales* daggered. *Involucre* many-leaved.

Mulen-pullu. *Rheed. Hort. Mal.* 12. *p.* 101. *t.* 54.

A native of moist pasture ground.

Root fibrous. *Culms* three-sided, several, diffuse, from two to four inches long, smooth, towards the base leafy, and of a dark chesnut colour. *Leaves* sheathing, two or three embracing the base of each culm and about the same length. *Head* terminal, sessile, composed generally of one large capitulum in the centre, and four or five in the circumference; these
I. are again composed of small, incurved, from eight to twelve-flowered spikes. *Involucre* many-
190 leaved; the exterior three larger, being as long as the culm or longer. *Stigmas* two, revolute. *Seed* three-sided.

9. C. *squarrosus. Linn. sp. pl. ed. Willd.* 1. 274.

Culms erect, from four to six inches high, leaves as long as the culms. *Head* terminal, glomerate, round. *Involucre* many-leaved. *Scales* with acute, recurved points.

C. *pygmæus. Rottb. gram.* 20. *t.* 14. *f.* 4.

A native of Coromandel.

10. C. *cistatus. Linn. sp. pl. ed. Willd.* 1. 275. *Rottb. gram.* 23. *t.* 6. *f.* 1.

Culm from three to six inches high, with sharp angles. *Heads* generally single, and sessile; *scales* with a long recurved point. *Involucre* three-leaved.

Scirpus *intricatus. Mant.* 182.

A native of moist pasture ground. It is in general from three to six inches high, though sometimes I have met with luxuriant specimens ten inches in height.

Root fibrous. *Culms* erect, from three to six inches high, three-sided, two-thirds naked, smooth; sharp. *Leaves* sheathing, erect, short, sheaths purple. *Head* generally simple, and sessile, though sometimes, there is a second, which is peduncled; and in the larger plant above-mentioned there are two or three sessile, and two or three peduncled, they are composed of small, sessile, ragged, from six to eight-flowered spikelets. *Involucre* three or four-leaved, broad, unequal, the largest being about the length of the culm. *Calyx; scales* tapering to a long, fine recurved point, which gives the spikes the ragged appearance they have. *Seed* three-sided.

11. C. *pectinatus. R.*

Culms three-sided, leafy, from eight to twelve inches high, straight. *Umbel* terminal, sessile. *Involucre* length of the umbel. *Spikes* all sessile, linear, pectinate, *scales* mucro-
I. nate. *Seeds* three-sided.
191 A native of Coromandel.

Culms erect, straight, three-sided, leafy toward the base; from eight to twelve inches high. *Umbel* terminal, simple, sessile, globular, composed of about twelve sessile, linear, diverging spikes. *Involucre* from two to three-leaved, the longest leaflet about as long as the umbel. *Scales* with long, acute, recurved apices. *Stamina* three. *Style* with a three-cleft apex. *Seed* obovate, three-sided, smooth, dark ash-coloured.

12. C. *niveus. Linn. sp. pl. ed. Willd.* 1. 273. *Retz. Obs.* 5. *p.* 12.

Culms from five to eighteen inches high. *Umbels* or rather heads, sessile. *Involucre* two-leaved. *Style* three-cleft. *Seed* three-sided.

A native of shady moist pasture land.

Root creeping, fibrous. *Culms* erect, from five to ten inches high, mostly naked, three-sided, smooth. *Leaves* surrounding the base of the culm, sheathing; those that are nearest the root are little more than sheaths, those within are nearly as long as the culm, and waved. *Umbel* terminal, simple, sessile, about an inch each way, composed of linear, many flowered, sessile spikes. *Involucre* two-leaved, length of the spikes. *Seed* three-sided.

13. C. *jemenicus. Linn. sp. pl. ed. Willd.* 1. 281.

Culms from two to four inches high, obscurely three-cornered; base *bulbiferous*. *Umbels* simple. *Involucres* and *spikelets* alternate. *Scales* acute. *Seed* roundish, three-sided.

Puri-gaddi is the Telinga name of the plant, and Puri-dumpa that of the roots.

A native of dry sandy pasture ground near the sea.

I. *Root* bulbiferous, stoloniferous. When the small oval bulbs are taken up entire they
192 appear covered and entirely surrounded with two, three, or four black and brown, longitudinally striated sheaths, which burst and fall off in succession. There are many capillary fibres issuing from the base of the culm. The stolones generally push their way up through the sheaths, and out at their mouths, run horizontally, producing from their extremities the new plant. On removing the sheath a small truncated, pointed ball is observed, resting in the upper side of the base of the culm, which (onion-like) is formed by the united sheaths of the leaves. This little bulb, which is slightly connected to the base of the culm on which it rests, is the eatable part; it is composed of two or three coats, and about the size of a pea; when its proper exterior brown membranous sheath is removed, it is very white, inviting to the eye, and pleasant to the taste. *Culm* erect, two-thirds naked, between round, and three-sided, two, three, or four inches long. *Leaves* a few, filiform on the upper side, grooved, four or five inches long, below the surface of the earth, their sheaths form the little firm culm above-mentioned; from its head the capillary roots and stolones issue. *Umbel* simple, composed of from six to ten sessile, linear, diverging spikes. *Involucre* generally three-leaved, unequal, the largest twice as long as the spikes; they issue not as usual from the same point, but alternately one above another. *Scales* oblong, striated. *Stigma* two-cleft. *Seed* roundish, three-sided, grey.

Obs. The little bulbs are gently roasted or boiled, then rubbed between the hands or the folds of a cloth, to take off the sheaths, which is all the preparation the natives give them, to make them a pleasant wholesome part of their diet, which they have frequent resource to, particularly in times of scarcity. Some dry them in the sun, grind them into meal, and make bread of them, while others stew them in their curries and other dishes; they are palatable, tasting like a roasted potatoe. I wish they could be enlarged by culture, when they might soon prove a valuable acquisition, for on account of their smallness, it is troublesome and tedious gathering and cleaning any quantity of them. Page Carey Ed. I. 193

14. C. *polystachyos. Linn. sp. pl. ed. Willd.* 1. 275. *Rottb. gram.* 39. *t.* 11. *f.* 1. *Vahl. enum. pl.* 2. 315.

Culm twelve inches long; *leaves* short; *umbel* compound, sessile, crowded. *Involucre* many-leaved. *Style* two-cleft. *Seeds* linear, obcordate, without angles.

Gramen cyperoides, &c. *Pluck. mant.* 97. *tab.* 416. *fig.* 6. is not unlike this plant.

A native of moist pasture land, of ditches, &c.

Root fibrous. *Culms* erect, about a foot high, simple, three-sided, smooth, lower part involved in the sheaths of the leaves. *Leaves* shorter than the culm, smooth. *Umbel* terminal, compound, crowded, sessile, about an inch each way. *Umbellets* sub-sessile, crowded, composed of numerous, sessile, linear-lanceolate spikes. *Involucre* from four to six-leaved, unequal, the longest being from six to eight inches long, and the shortest, only one. *Stigma* two-cleft. *Seed* compressed, oblong-obcordate.

15. C. *punctatus. R.*

Culms from two to six inches high, shorter than the leaves. *Umbel* compound. *Involucres* longer than the leaves. *Seeds* oval, compressed, dotted.

Gramen cyperoides elegans, &c. *Pluck. t.* 192. *f.* 3.

A small elegant species; a native of moist pasture ground.

Root fibrous. *Culms* erect, from two to six inches high, half naked, three-sided, smooth. *Leaves* sheathing, the lower ones little more than the sheaths, the superior ones longer than the culm. *Umbel* terminal, compound, about an inch each way. *Umbellets* some sessile, some peduncled, composed of linear, many-flowered spikes. *Involucre* from three to four-leaved, unequal, longer than the culm; *scales* daggered. *Seed* compressed, obovate, beautifully marked with white dots, on a dark-coloured ground, hence the specific name.

Obs. In König's catalogue he called this C. *pygmæus.* I. 194

16. C. *capillaris. Kön. Mss.*

Culm filiform, from one to two feet high. *Umbel* of one sessile, and two pedicelled umbellets. *Involucre* three-leaved, filiform, florets diandrous. *Style* two-cleft. *Seed* obovate, without angles.

A native of moist pasture ground.

Root fibrous. *Culms* erect, from twelve to eighteen inches high, three-sided, filiform, three-fourths or more naked. *Leaves* sheathing, generally two to each culm; the lower one short, superior one as long as the culm, very slender and smooth. *Umbel* small, compound, generally composed of one sessile, and two peduncled umbellets, these are again composed of linear, many-flowered spikes. *Involucre* three-leaved, filiform, the largest is longer than the culm; the shortest about an inch long, and the other between the two. *Scales* membranaceous, obtuse. *Stamens* two. *Style* two-cleft. *Seed* obovate, compressed, brown, pretty smooth, half hid in the rachis.

17. C. *compressus. Linn. sp. pl. ed. Willd.* 1. 282. *Vahl. enum. pl.* 2. 324.

Culms from six to ten inches high, shorter than the leaves, angles blunt. *Umbel* simple or compound. *Involucre* three-leaved. *Scales* daggered. *Seed* obcordate, triangular.

Gramen cyperoides rarius, &c. *Pluck. t.* 192. *f.* 1.

Beng. Chooncha.

Teling. Salitunga.

Delights in a moist soil.

Root fibrous. *Culms* erect, from six to ten inches high, two-thirds naked, three-sided, smooth; angles blunt. *Leaves* numerous, sheathing, many of them longer than the culms, smooth and glossy. *Umbel* terminal, simple, or compound; when compound the umbellets are peduncled, from one to three, and consist of from three to six, green, linear, sessile, many-flowered spikes. *Involucre* three-leaved, smooth, the largest of them is nearly as long as the culm. *Scales* acute. *Seed* turbinate, three-sided, smooth, dark-brown colour. I. 195

Obs. The upper flowers of the spike are incomplete.

18. C. *castaneus. Linn. sp. pl. ed. Willd.* 1. 278.

Culms from two to six inches high, length of the leaves. *Umbels* generally compound; length of the involucre. *Scales* with long recurved points, monandrous. *Seed* rugose, obtusely triangular.

A most beautiful delicate, small species; delights in moist, sandy, pasture land.

Root fibrous. *Culms* erect, from two to six inches high, naked, three-sided, smooth. *Leaves* sheathing, filiform, scarcely so long as the culm. *Umbel* terminal, one or one and a half inch, simple, or compound, but in general composed of from one to five small peduncled umbellets, and one or two sessile ones. *Spikelets* linear, many-flowered. *Scales* three-keeled, with a recurved point, green keel and chesnut-coloured sides. *Stamen* single, (at least I have not found more.) *Style* two-cleft. *Seed* obtusely three-sided, oblong, rugose.

19. C. *difformis. Linn. sp. pl. ed. Willd.* 1. 280. *Vahl. enum.* 2. 337.

Culm from nine to eighteen inches high, angles sharp. *Umbels;* compound *umbellets* glomerate; *spikelets* crowded. *Involucre* from two to three leaved. *Scales* imbricated. *Seed*

Page Carey Ed. obovate, three-sided.

Gramen cyperoides, &c. *Pluck. alm.* 192. *f.* 3.

Beng. Behoora.

Grows equally in either a dry, or wet sandy soil.

Root fibrous. *Culms* two-thirds naked, erect, from nine to eighteen inches high, three-sided, smooth, angles sharp. *Leaves* sheathing, as long as the culm, keeled, smooth. *Umbel* compound, small, being only an inch and a half each way. *Umbellets* from two to four, sub-
I. sessile, and from two to four longer or shorter peduncled, globular, composed of innumerable,
196 very small, oval spikes. *Involucre* from two to three-leaved, very unequal, the longer being half as long as the culm; and the third (when present) less than an inch. *Scales* imbricated, margins membranaceous. *Seed* three-sided.

20. C. *pumilus. Linn. sp. pl. ed. Willd.* 1. 282. *Rottb. gram.* 29. *t.* 9. *f.* 4. *Vahl. enum. pl.* 2. 330.

Culms about six inches high, angles blunt. *Umbels* compound; *umbellets* sub-globular. *Spikelets; scales* daggered.

Delights in a moist soil.

Root fibrous. *Culms* erect, six inches high, half naked, obsoletely three-sided, smooth, angles rounded. *Leaves* sheathing, shorter than the culm. *Umbel* compound; *umbellets* from three to six, shorter or longer peduncled, globular, composed of ten or twelve linear, many-flowered spikes. *Involucre* three or four-leaved, unequal, the largest as long as the culm. *Scales* acute.

21. C. *eruentus. Linn. sp. pl. ed. Willd.* 1. 275. *Rottb. gram.* 21. *t.* 5. *f.* 1.

Culms three-sided, from six to twelve inches long. *Leaves* sub-radical; *umbel* compound; *involucre* three or four-leaved. *Scales* obtuse. *Flowers* diandrous. *Style* two-cleft. *Seed* round and smooth.

A native of low pasture land all over Bengal, &c. where it is found growing in tufts during the rainy season, like most of this natural order.

Obs. Cattle rarely eat it except when pressed by hunger.

22. C. *incurvatus. R.*

Culms triangular, base leafy, incurvate. *Umbel* compound. *Involucres* two or three, incurvate. *Spikes* needle-shaped, incurved. *Scales* oblong, obtuse. *Stigma* three-cleft.

I. A native of the moist banks of the Ganges. Flowers during the cool season.
197 *Roots* creeping, stoloniferous, with dark-coloured fibres. *Leaves* ensiform, polished, shorter than the culms. *Culms* slightly incurved, leafy round the base, triangular, with sharp angles, concave sides, and from one to two feet high. *Involucre* two, or three-leaved, incurved, one of them two or three times longer than the umbel. *Umbel* compound. *Spikes* needle-shaped, incurved. *Scales* oblong, obtuse, with a green rib. *Stamina* three. *Germ* oblong. *Stigma* three-cleft. *Seed* linear, oblong, three-sided, smooth, brown.

23. C. *tortuosus. Kön. Mss.*

Culms obtusely three-sided, from six to eight inches high. *Umbel* compound, length of the involucre. *Spikelet* linear, incurved, flowers diandrous. *Seed* obovate, compressed, without angles.

A native of moist pasture ground.

Root somewhat tuberous, with filiform fibres. *Culms* erect, from six to eight inches high, naked, three-sided, smooth. *Leaves* radical, shorter than the culm. *Umbel* compound. *Umbellets* from four to eight, shorter and longer peduncled, composed of large, linear, many-flowered, chesnut-coloured, curved spikes. *Involucre* three-leaved, longer than the umbel. *Stamina* two. *Style* two-cleft. *Seed* obcordate, compressed, smooth.

24. C. *rotundus. Linn. sp. pl. ed. Willd.* 1. 283. *Vahl. enum. pl.* 343.

Root tuberous. *Culms* from one to two feet high, obtusely three-sided. *Umbel* compound; *spikelets* alternate; *involucre* three-leaved, length of the umbel. *Seed* angled.

C. rotundus. *Rumph. Amb.* 6. *p.* 1. *t.* 1. *fig.* 1. 2.

C. *hexastachyos. Rottb.* 28. *t.* 14. *f.* 2.

Sans. Moosta, Moostuka.

Beng. Mootha.

I. *Teling.* Shaka-tunga.
198 This is by far the most common species we have in India; it delights in a moist sandy soil, though it grows abundantly every where.

Root tuberous, with filiform fibres; *tubers* about the size of filberts or acorns, of irregular form, outwardly a dark brownish rust colour; inwardly firm, tender, white, and very fragrant. *Culms* erect, from one to two feet high, naked, three-sided, smooth, with the angles rounded. *Leaves* radical, or only investing the base of the culm, sheathing, shorter than the culm, smooth, glossy. *Umbels* terminal, compound in very luxuriant plants, sometimes decompound, from two to three inches each way. *Umbellets* from two to eight, all having peduncles of from one-fourth of an inch to two inches long. *Involucre* generally three-leaved, unequal, smooth, the largest is only a little longer than the umbel. *Spikes* linear, subsessile. *Seed* obsoletely three-sided, brown, a little rugose.

Obs. Cattle eat it. Hogs are remarkably fond of the roots. Dried and powdered they are used as a perfume at the weddings of the natives. It is by far the most troublesome weed we have in our gardens, there is no extirpating it, as every little bit of the root grows readily.

25. C. *pertenuis. R.*

Culms from three to four feet high, sub-rotund at the base, three-cornered above. *Leaves*

few. *Umbel* compound and decompound. *Spikelets* filiform, many-flowered. *Seeds* three-sided. Page Carey Ed.

Beng. Nagur-Mootha.

This most delicate, tall, slender species, I have only found in low wet places, in the vicinity of Calcutta.

Root somewhat tuberous, with many dark-coloured villous fibres. *Culms* naked, except at the base, straight, generally three or four feet high, slender, tapering much, toward the base nearly round, becoming more and more three-sided, till they are acutely so at the umbel. *Leaves* one or two at the base of each culm, slender, about one-third the length of the culm. *Umbel* compound and decompound, very small for the height of the plant, generally composed of one sub-sessile umbellet, and three or four, on naked, smooth, filiform peduncles, of different length, and these again composed of from four to twelve, most slender, long, filiform, many-flowered spikelets. *Involucre* three-leaved, the longest about the length of the umbel, the other two shorter, all slender, and tapering to most acute points. *Scales* membranaceous. *Stamens* three. *Style* three-cleft. *Seed* three-sided. I. 199

Obs. Its naked delicate form, small and compound umbel, short slender leaves, and scanty involucre, immediately distinguish it from all the other Indian species I have yet met with.

26. C. *tuberosus. Linn. sp. pl. ed. Willd.* 1. 281. *Rottb. gram.* 28. *t.* 7. *f.* 1. *Vahl. enum. pl.* 2. 340.

Root tuberous. *Leaves* linear, length of the culms. *Umbels* compound, or decompound. *Involucre* three-leaved, longer than the umbel. *Style* three-cleft. *Seed* oblong, three-sided.

This seems to me to be only a luxuriant variety, if so much, of C. *rotundus.* It grows in the same places, the roots are tuberous, &c. in short, I can scarcely perceive any difference.

27. C. *tenuiflorus. Linn. sp. pl. ed. Willd.* 1. 284. *Rottb. gram.* 30. *t.* 14. *f.* 1. *Vahl. enum. pl.* 2. 374.

Culm from two to four feet high, sharp angled. *Involucre* three or four-leaved, much longer than the decompound *umbel. Spikelets* alternate. *Scales* obtuse. *Seeds* obcordate, three-sided.

Teling. Gelleba-tunga.

Grows in standing sweet water.

Root creeping, with ramous fibres. *Culm* erect, from four to six feet high, naked, three-sided, smooth; *angles* sharp. *Leaves* mostly radical, shorter than the culm, deeply channelled, smooth. *Umbel* terminal, decompound, from four to eight inches each way. All the *umbellets* pedunculed, oblong, spreading, composed of alternate, sessile, lanceolate, from twenty to thirty-flowered spikes. *Involucre* three or four-leaved, very unequal, the largest being from one to two feet long, and the shortest about one or two inches. *Scales* obtuse, apex often emarginate and membranaceous. *Seeds* three-sided, obovate. I. 200

28. C. *strictus. R.*

Culms about twelve inches high, stiff and straight, shorter than the leaves; *angles* sharp. *Umbel* decompound, straight; *flowers* diandrous. *Seeds* obovate, compressed, without angles.

Delights in a moist uncultivated soil.

Root fibrous. *Culm* straight, rigid, about a foot high, obtusely three-angled, three-fourths naked, smooth. *Leaves* mostly radical, sheathing, many of them longer than the culm, erect, rigid, much keeled, smooth. *Umbel* erect, linear, thin, sometimes decompound, though in general only compound. *Umbellets,* one or two sessile; and from three to eight with peduncles of unequal lengths; the largest peduncles are compound. *Involucre* from three to five-leaved, very unequal; the largest nearly as long as the culm, the smallest not more than an inch long. *Spikes* sessile, lanceolate in small plants, in large ones linear. *Stamens* two. *Style* two-cleft. *Seed* compressed, obcordate.

29. C. *flavidus. Linn. sp. pl. ed. Willd.* 1. 279. *Retz. Obs.* 5. 13. *Vahl. enum. pl.* 2. 334.

Culms from six to eight inches high, generally shorter than the leaves. *Umbel* decompound, longer than the involucre; *umbellets* globular; *spikelets* crowded; *flowers* monandrous. *Seeds* obcordate, three-sided.

This is a small delicate species, a native of moist places on the coast of Coromandel.

Root fibrous, dark purple. *Culm* erect, from six to eight inches long, naked, three-sided, smooth. *Leaves* sheathing, very short, embracing the base of the culm. *Umbel* compound, or decompound, from one to two inches high; *umbellets* one or two sessile, and from two to eight on peduncles of various lengths; the highest sometimes bears a small partial umbellet. *Involucre* two-leaved, shorter than the umbel. *Spikes* lanceolate, chesnut-coloured. *Flowers* monandrous. *Seeds* white, short, three-sided, a little rough. I. 201

30. C. *Iria. Linn. sp. pl. ed. Willd.* 1. 286. *Vahl. enum.* 2. 360.

Culms from one to two feet high; *angles* sharp; *umbels* decompound, shorter than the involucres; *spikelets* alternate; *flowers* rather distinct; *scales* imbricated. *Seeds* obovate, angular.

Ica. Rheed. Mal. 12. *p.* 165. *t.* 56. does not very well agree with my plant.

C. [illegible] *Pluk. Phyt. t.* 131. *f.* 7. is much more like this plant than the above-quoted plant of Van Rheede.

Beng. Bara-chooeha.

Is a native of moist, cultivated lands.

Page Carey Ed.

Root fibrous. *Culms* erect, from one to two feet high, four-fifths naked, three-sided, sharp-angled. *Leaves* sheathing, nearly the length of the culm, keeled, smooth. *Umbel* decompound, from two to four inches high; *umbellets* from four to eight, one or two sessile, the rest unequally peduncled; *partial* umbellets lanceolate, raceme-like, being composed of alternate, linear, from six to twelve-flowered spikes. *Involucre* from three to four-leaved, the largest two or three times as long as the umbel. *Scales* imbricated, with membranaceous sides. *Style* two-cleft. *Seeds* three-sided, length of the scales.

31. C. *inundatus. R.*

I. 202 *Culms* from two to four feet high, exactly triangular. *Leaves* as long as the culms. *Involucre* from four to five-leaved, one very long. *Umbel* decompound. *Spikelets* lanceolate. *Stamens* two. *Style* two-cleft. *Seed* obcordate, a little compressed.

Beng. and *Hind.* Patee.

Found in great abundance on the low banks of the Ganges and rivulets near Calcutta; where the tide rises high over it, it thrives most luxuriantly, and helps much to bind, and protect the banks from the rapidity of the water.

Root jointed, creeping, stoloniferous, perennial. *Culms* erect, from three to four feet high, exactly three-sided, about as thick as the little finger. *Leaves* numerous, radical, or surrounding the base of the culms, smooth, deeply channelled on the inside, and keeled on the back. *Universal involucre* composed of four or five leaves of very unequal lengths, the largest being two feet or more long, and the shortest as many inches; *partial involucre* subulate. *Umbel* decompound, erect, about a span long. *Spikelets* sessile, diverging, lanceolate, rigid, obtuse. *Style* two-cleft. *Seeds* obcordate, a little compressed, smooth.

32. C. *Pangorei. Rottb. gram.* 31. *t.* 7. *f.* 3. *Linn. sp. pl. ed. Willd.* 1. 284.

Culms from three to four feet high, naked. *Leaves* scarcely any. *Umbels* decompound; *involucre* three or four-leaved; *involucels* setaceous. *Spikelets* filiform. *Seeds* oblong, compressed.

Teling. Chumati Patee.

It is common on the banks of the Ganges, and serves, with C. *inundatus*, the same useful purposes, though in an inferior degree.

Root jointed, creeping, stoloniferous, perennial. *Culms* erect, naked, smooth, three-sided towards the apex, sides concave, from two to four feet high, and about as thick as a goose-quill. I. 203 *Leaves* one or two, sword-shaped, very short, involving with their sheaths the base of the culm. *Universal involucre* three or four-leaved, very smooth, the longest twice the length of the umbel; *partial* minute, setaceous. *Umbel* decompound, composed of one sessile umbellet in the centre, and from four to eight spreading, compound ones in the circumference, supported on fine, compressed peduncles of unequal lengths. *Spikelets* filiform, from ten to twenty-flowered. *Scales* obtuse. *Stamens* three. *Seed* oblong, compressed.

Obs. Its naked, exactly three-sided culms, and scarcity of short leaves readily distinguish it from all the other species I have yet described. C. *tegetum* has the angles rounded, and no leaves.

33. C. *procerus. Rottb. gram.* 29. *t.* 5. *f.* 3.

Culms from three to six feet high, angles sharp. *Umbel* decompound. *Involucres* none; *Spikelets* alternate, linear; *flowers* diandrous. *Seeds* obcordate, compressed, without angles.

Pota-pullu. Rheed. Mal. 12. *p.* 93. *t.* 50.

Is a native of moist vallies, rivulets, &c. amongst the mountains.

Obs. In Bengal this plant, or one exceedingly like it, (for it differs from it only in having three stamens, the culm, leaves, umbels, scales, and seeds being the same) grows on the banks of the Ganges and so low as frequently to be entirely under water during the high tides; yet it thrives and helps to bind the banks of the rivers where it grows, and is one of those plants that prevent their giving way so much to the rapidity of the stream as they otherwise would do.

34. C. *spinulosus. R.*

Culms from three to five feet high, rigid. *Umbel* scarcely decompound; *spikes* long and short peduncled, globular; *spikelets* rigid, from three to four-flowered; *involucre* and *involucels* many-leaved.

Teling. Kurra-tunga.

I. 204 A large strong coarse species, grows in ditches and water courses.

Root fibrous. *Culms* erect, from two to five feet high, very rigid, obsoletely three-sided, smooth, four-fifths naked. *Leaves* sheathing, length of the culm, rigid, striated, margins hispid. *Umbel* terminal, decompound, from six to eight inches each way. *Umbellets* with peduncles of various lengths, composed of peduncled, globular heads, and these again of numerous small, sessile, linear, lanceolate, rigid, spinulous-pointed, from three to four-flowered spikelets. *Involucre* from four to six-leaved, unequal, the largest being from two to three feet long, and the shortest about the same number of inches, margins hispid, like those of the leaves. *Involucel* from three to six-leaved, length of the umbellets. *Scales* linear.

Obs. I have not seen the pistil nor seed. It is a remarkably coarse species; no animal eats it.

35. C. *elatus. Linn. sp. pl. ed. Willd.* 1. 287. *Vahl. enum.* 2. 363.

Culms from six to twenty feet long, sharp-angled. *Umbel* scarcely decompound. *Spikes* all sub-sessile, linear, erect. *Spikelets* most numerous, alternate, from six to eighteen-flowered, anthers ending in a thread. *Seeds* oblong, three-sided.

Beng. Gol-mulunga.

Teling. Rakisha.

This is by far the largest species on the coast of Coromandel. It grows in sweet standing water. Page Carey Ed.

Root fibrous. *Culms* erect, from six to twenty feet high, and thick in proportion, naked, except near the base, three-sided, angles sharp, rigid and scabrous, so as to cut the hand readily, other parts pretty smooth. *Leaves* sheathing, in small plants, as long as the culm, about an inch in diameter at the broadest part, triangularly concave, with the keel and margins sharply serrate. *Umbel* terminal, decompound, erect, small for the size of the plant, being only about a foot high in middle-sized plants. *Umbellets* one, or two, sub-sessile and from eight to ten peduncled, composed of erect, linear, short-pedicelled, compound spikes, of simple, sessile, lanceolate, from six to ten-flowered spikelets which surround every part of the compound spikes. *Involucre* three-leaved, with some smaller within these three, margins and keel as in the leaves. *Involucels* small, one-third the length of the umbellets. *Scales* membrane-bordered, acute. *Filaments* three, membranaceous. *Anthers* ending in a thread. *Seeds* three-sided. I. 205

36. C. *umbellatus. Vahl. enum. pl.* 2. 362.

Culms from four to six feet, blunt-angled. *Umbel* decompound; *spikes* all sub-sessile, linear, spreading; *spikelets* numerous, alternate, from three to four-flowered. *Seed* elliptic, three-sided.

Teling. Pedda shaka.

A large species, growing in standing fresh water.

Root fibrous. *Culms* erect, from four to six feet high, pretty smooth, naked, except at the base, obsoletely three-sided, angles rounded, sides hollowed. *Leaves* mostly radical, sheathing, the longest of them about as long as the culm. *Umbel* decompound, spreading, about six inches each way. *Umbellets*, two or three sub-sessile, and from five to ten on pretty long peduncles of unequal lengths; they are composed of small partial, short-pedicelled umbellets of three to six linear compound spikes, composed of numerous, small, sessile, from three to four-flowered, simple spikelets. *Involucel* from three to four-leaved, of the length of the umbellets. *Involucre* from three to six-leaved, unequal; the longest from two to three feet, the shortest as many inches. *Seeds* three-sided, smooth.

37. C. *digitatus. R.*

Culms from one to six feet high. *Umbel* decompound, fastigiate. *Involucre* and *involucels* many-leaved; *spikes* digitate, linear; *spikelets* diverging, many-flowered; *scales* with long recurved points. I. 206

A middle sized species; grows in marshy places, ditches, &c.

Root, a somewhat tuberous head with many fibres. *Culm* erect, from one to six feet high, mostly naked, smooth, three-sided. *Leaves* sheathing as in the other species, their margins slightly armed with minute prickles. *Umbel* compound or decompound, from two to four inches high. *Umbellets* sessile, and peduncled, composed of erect, compound spikes, of small diverging, linear, acute, from four to six-flowered spikelets. *Involucre* many-leaved, unequal, most of them longer by far than the umbel, margins armed like the leaves. *Involucel* many-leaved, length of the umbellets. *Seed* three-sided, oblong, with grooved sides.

Obs. In Bengal I have met with this species six feet high, with a decompound umbel, a foot or more every way, and with from twelve to twenty-four flowers to the spikelets, the culm between round and three-sided, and in the largest almost entirely round.

38. C. *verticillatus. R.*

Culms four feet high, three-cornered, leafy at the base. *Umbel* decompound; *involucre* many-leaved; *involucels* filiform, *spikes* of the umbellets verticelled; *spikelets* lanceolate. *Scales* with a blunt point. *Seed* linear, oblong, three-sided.

Beng. Burethi.

Found during the rains, in wet low places, in the vicinity of Calcutta.

Root perennial, somewhat tuberous, with numerous dark-coloured, thick, spongy fibres. *Culms* naked, except just at the base, from two to six feet high, and about as thick as a stout quill, absolutely three-sided, smooth, shining, deep green. *Leaves*, one, two, or three at the base of each culm, and about the same length, keeled, somewhat spongy, very deep green, whitish underneath, margins armed with minute, short, sharp, aciculæ, pointing forwards. I. 207

Umbel, compound and decompound. *Umbellets* many on smooth somewhat angular peduncles of various lengths, composed of from five to eight cylindric, spreading spikes in a verticel, with an erect, sessile, simple or pedicelled compound one in the centre. *Spikelets* most numerous, imbricated, lanceolate, from eight to twelve-flowered. *Involucre* many-leaved, some of them nearly as long as the culm, and like the radical leaves keeled and armed on the margins. *Involucels* scarcely so long as their respective umbellets. *Scales* of the spikelets boat-shaped, with membranaceous margins, and sharp thickened points. *Stamens* three. *Seed* oblong, obsoletely three-sided.

Obs. This species comes near Rottboel's *Cyperus alopecuroides.*

39. C. *distans. Linn. sp. pl. ed. Willd.* 1. 288. *Vahl. enum. pl.* 2. 362.

Culms about three feet high, three-cornered. *Umbel* decompound, with the *involucre* and *involucels* many-leaved; *spikelets* linear, alternate; *flowers* distant, with obtuse scales. *Seeds* oblong, three-sided.

C. *elatus. Rottb. gram.* 37. *t.* 10.

Beng. Panee-mulunga.

It is a native of wet places around Samulcota.

Root fibrous. *Culms* erect, two feet high, four-fifths or more naked, three-sided, smooth; angles blunt. *Leaves* from two to four, embracing the base of the culm, and nearly as long,

Page Carey Ed. sheathing, deeply grooved above, and keeled below, smooth. *Umbel* decompound, from four to six inches high. *Umbellets* some sessile, and from four to eight, with erect peduncles of unequal lengths. *Partial umbellets* oblong, raceme-like, being composed of alternate, needle-like, diverging spikes. *Involucre* from three to six-leaved, unequal; the largest about a foot, or fifteen inches long, all are smooth. *Involucels* three-leaved, length of the umbellets. *Flowers* remote, scales obtuse. *Seed* three-sided.

I. 208 40. C. *tegetum.* R.

Leafless, culms from three to six feet high, angles rounded, umbel decompound. *Involucre* as long, and longer than the umbel; *involucels* chaffy. *Spikelets* linear-lanced, alternate. *Seed* clavate, three-sided.

Hind. and *Beng.* Madoor-kati.

Is common in ditches, borders of lakes, &c. in the vicinity of Calcutta during the rains.

Root creeping under ground, perennial. *Culms* naked, generally from three to six feet high, obsoletely three-sided, smooth. *Leaves* no other than two or three sheaths embracing the base of the culms. *Umbel* decompound; *umbellets* sub-sessile, and on peduncles of various lengths, sub-erect. *Involucre* about four-leaved, one or two of them longer than the umbel. *Involucels* minute. *Spikelets* alternate, linear-lanceolate, many-flowered. *Seeds* elliptically triangular.

Obs. Those elegant, useful, durable, large mats so common on the floors of rooms in and about Calcutta, are made of the culm of this plant. When green they are split into three or four pieces, which in drying contract so much as to bring the margins in contact, or to overlap each other; in this state they are woven.

41. C. *alopecuroidus. Rottb. gram.* 38. *t.* 8. *f.* 2. *Vahl. enum. pl.* 2. 368.

Culms from four to five feet high. *Umbel* decompound; *involucre* three-leaved; *spikes* nodding; *spikelets* alternate, many-flowered.

Wara-pulla. *Rheed. Mal.* 12. *p.* 77. *t.* 42.

Cyperus *glomeratus. Linn. sp. pl. ed. Willd.* 12. 277.

This is also a large species, and a native of the same places.

Root fibrous. *Culms* erect, from four to five feet high, except at the bases three-sided, smooth. *Leaves* as in the other species. *Umbel* decompound, drooping, from six to twelve

I. 209 inches high. *Umbellets* one or two sub-sessile, and from four to eight with peduncles of various lengths. *Partial umbellets* peduncled and composed of beautiful, linear, bowing, compound racemes of lanceolate, many-flowered, chesnut-coloured spikelets. *Involucre* three-leaved, unequal. *Involucels* small, frequently only chaffy scales. *Seed* three-sided, smooth.

Obs. I have seen small plants with the umbellets small, dense and globular.

42. C. *nudus. R.*

Leafless. *Culms* from four to six feet high, three-cornered. *Umbels* super-decompound, naked. *Involucres*, and *involucels* chaffy; *spikelets* subulate, alternate. *Seed* oblong, compressed without angles.

Beng. Goola-Methhi.

A native of low wet places over Bengal. Flowers during the rains.

Root perennial, somewhat tuberous. *Leaves* no other than a short sheath or two, which envelope the base of the culm, the uppermost one sometimes ends in a short ensiform leaflet, *Culm* about five feet high, naked, smooth, bright-green, three-cornered, with the angles rounded. *Involucres* three or four, sub-lanceolate, erect, about one-fourth the length of the umbel. *Umbels* decompound and super-decompound, with the sub-divisions, and slender, smooth compressed peduncles of various length. *Spikelets* alternate, subulate, of a bright brown colour, each bearing from twenty to thirty flowers. *Stamens* three. *Style* three-cleft. *Seed* oblong, compressed, without angles.

Obs. This species is very like C. *tegetum*, and about the same size, though I am informed, never used for mats, as that is. To know it from C. *tegetum* attend to the involucre,

I. which in this is only about one-fourth the length of the umbel, but in that as long or longer.

210 43. C. *Haspan. Linn. sp. pl. ed. Willd.* 1. 287.

Culms from four to sixteen inches high. *Umbel* super-decompound, involucre two leaved. *Seeds* globular, white.

Gramen cyperoides madasarpatanum, &c. *Pluck. alm.* 192. *f.* 2.

Teling. Poo-cushalic.

An elegant small species, a native of cultivated moist places.

Root fibrous. *Culms* erect, from four to twelve inches high, three-fourths naked, obsoletely three-sided, smooth. *Leaves* sheathing, often as long as the culm, very slender. *Umbel* super-decompound, in small plants as long as the culm. *Umbellets* one or two sessile, and from four to six-peduncled. *Partial umbellets* of the first and second degrees pedicelled. *Involucre* generally two-leaved, unequal, the longest rather longer than the culm; *involucel* a few chaffy scales only. *Stamens* two or three. *Seed* sub-globular, pure white, smooth.

SCIRPUS.

Glumes chaffy, imbricated on all sides. *Corol* none. *Seed* one.

SECT. 1. *Without Leaves.*

1. S. *tuberosus. R.*

Root tuberous. *Culms* culmmar, jointed, leafless. *Spikes* terminal, cylindric, naked. *Scales* oblong. *Base* of the style cordate. *Seed* obcordate, beset with glochidate bristles. Page Carey. Ed.

Pi-tsi, Maa-tai, Pu-tsai, or Pe-tsi, or water chesnut of the Chinese.

It is mentioned by Abbe Grosier under the first name, and under the other appellations was transmitted from Canton, by Mr. Duncan, at the desire of the Governor General, for the Company's Botanic garden, where it blossoms about the close of the rains, in September. I. 211.

Root fibrous, with stoloniferous shoots and round turnip-shaped tubers. *Culms* erect, naked, slightly twisted to the right, inwardly intercepted by slender membranes, distant a line, or a line and a half from each other, every eighth or tenth of these partitions, is of a firmer texture than the others and visible on the outside, even when the plant is growing. *Leaves* none except a slender short sheath or two at the base of each culm. *Spike* terminal, solitary, cylindric, naked. *Scales* oblong, membranaceous margined. *Stamens* three. *Style* two or three-cleft, at the base swelled out into an ovate-cordate, compressed shape. *Seed* obcordate, surrounded with glochidate bristles.

Obs. For the economical uses of the tuberous roots of this plant, I beg leave to refer to Abbe Grosier, and other historians who have had opportunities of observing in what manner they are employed by the Chinese, and to the following extract from Mr. Duncan's letter which accompanied the plants.

"The *Maa-tai*, *Pee-tai* or *Pi-tse* of Abbe Grosier, the *water-chesnut*, grows in ponds, which are manured for its reception about the end of March. A pond being drained of its water, small pits are dug in its bottom, these are filled with human manure, and exposed to the sun for a fortnight; their contents are then intimately blended with the slimy bottom of the pond, and the slips or roots of the plant deposited therein; the water is now returned to the pond, and the new crop of tubers comes to perfection by the beginning of September.

"This nut is in high estimation among all ranks of Chinese, not only as a pot root, but also a medicine. It is eaten either boiled or raw. I will not vouch for the truth of the singular virtues ascribed to the Maa-tai, but just relate one of the most plausible. The children here often play with cash in their mouths, which sometimes slip down into the stomach, and bring on alarming symptoms. The nut is immediately given in quantities, either raw or boiled, and they say it never fails to give relief, being considered a specific which has the effect of decomposing the metal."

2. S. *plantaginus. Linn. sp. pl. ed. Willd.* 1. 291. *Rottb. gram.* 45. *t.* 15. *f.* 2. *Vahl. enum. pl.* 2. 251. *Retz. Obs.* 5. 14. I. 212.

Culms culumnar, from two to four feet high, intercepted. *Spike* terminal, naked, subcylindric; *scales* oblong, obtuse. *Seeds* beset with bristles.

A leafless, rush-like species; it grows in shallow standing sweet water.

Root stoloniferous, with thick, spongy, and capillary fibres. *Culm* erect, round, smooth, naked, except the lower part, which is covered with a membranaceous sheath or two; inwardly intercepted with transverse, rigid septums, at every inch and quarter, besides numberless, irregular, smaller ones between. *Spike* terminal, cylindric, two inches long, naked. *Scales* obovate, smooth, a little keeled, margins membranaceous. *Stamens* three, with bristles intermixed round the base of the germ.

3. S. *tumidus. R.*

Culms from two to three feet high, round, regularly intercepted. *Spike* terminal, cylindric. *Scales* broad-lanceolate. *Seeds* beset with simple bristles.

This species is very much like the last described, and a native of similar places, but much rarer.

Root, the same. *Culm* erect, three feet high, round, smooth, naked, seemingly swelled, intercepted with a conspicuous transverse partition every sixth of an inch. *Leaves* none, but sheaths as in the former. *Spike* single, terminal, erect, cylindric, an inch long. *Scales*, broad-lanceolate, acute, a little keeled, otherwise smooth. *Stamens, bristles*, &c. as in the other species.

4. S. *spiralis. Linn. sp. pl. ed. Willd.* 1. 290. *Rottb. gram.* 45. *t.* 15. *f.* 1. *Vahl.* 2. 252.

Culms from two to three feet high, three-sided. *Spike* terminal, naked, cylindric, obtuse. *Scales* lapped. *Seeds* beset with bristles. I. 213.

This is a native of the same places with the last described.

Root stoloniferous, &c. as in S. *plantaginus*. *Culm* erect, from two to three feet high, naked, three-sided, angles sharp, smooth, not articulated, nor interrupted inwardly. *Leaves* none, but a sheath or two embracing the base of the culm. *Spike* as in S. *plantaginus*, but the flowers are more numerous. *Scales* imbricated seemingly without order, smooth, lapped, margins broad, and membranaceous. *Stamens, bristles*, &c. as in the two preceding species.

5. S. *acutangulus. R.*

Culms from two to three feet high, triangular. *Spike* terminal, tapering, acute; *scales* somewhat acute; *seeds* bristly.

Grows in similar places to those which produce the two last species.

Root as in the last species. *Culm* three-sided, from two to three feet high, naked, smooth; angles very sharp, even almost winged. *Leaves* no other than a sheath or two involving the base of each culm. *Spike* terminal, &c. as in the two former. *Scales* disposed spirally, oval, somewhat acute, striated, margins membranaceous. *Filaments* membranaceous. *Bristles*, &c. as in the former two.

Obs. It differs from S. *spiralis* in having the angles of the culm sharp. In having the flowers few and disposed spirally. In having the scales striated, oblong and somewhat pointed.

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6. S. *medius. R.*

Culms from one to two feet high, three-cornered. *Spike* terminal, sub-cylindric. *Scales* obtuse. *Seeds* bristly.

A species resembling the last, and growing in similar places.

I. 214 *Root* as in the species already mentioned. *Culm* erect, one or two feet high, smooth, three-sided, angles rounded. *Spike* as in the former. *Scales* smooth, obovate. *Stamens*, *bristles* and *pistil* as in the last four species.

7. S. *incurvatus. R.*

Culms in tufts, culumnar, from six to nine inches high, incurved, leafless, intercepted. *Spikes* in a globular, naked *verticil* near the base of the culm. *Stigma* trifid. *Seed* three-sided.

A native of moist places near Calcutta. Flowers during the cool season.

Root of rust-coloured, capillary fibres. *Culms* numerous, from their incurved shape forming nearly a globe, leafless, round, smooth, intercepted at every half inch or less; general length from six to eight inches, and thicker than a crow quill. *Sheaths* a few between the spikes and root. *Spikes* numerous, sessile, ovate-oblong, forming a round *verticil* about an inch and a half above the root. *Scales* round, ovate-obtuse. *Seed* ovate, triangular.

8. S *articulatus. Linn. sp. pl. ed. Willd.* i. 290. *Vahl. enum.* ii. 358.

Culms from two to four feet high, culumnar, intercepted with conspicuous partitions. *Spikes* pointed, crowded into a head near the base. *Seed* naked, three-sided.

Tsjelli. *Rheed. Mal.* 12. *p.* 135. *t.* 71.

Hind. and *Beng.* Putputi-chechka.

Teling. Lutti-pitta-allie.

This is also a native of standing sweet water.

Root stoloniferous, and fibrous as in the former. *Culm* erect, from two to four feet high, round, smooth, naked, intercepted inwardly by transverse septums at every inch, or half inch; they are conspicuous on the outside, even while the plant is growing. *Leaves* no other than a short sheath or two, involving the base of the culm. *Head* lateral, near the base of the

I. 215 culm sessile, sub-globular, composed of many, (fifty to sixty) oblong-pointed, sessile, many-flowered spikes. *Scales* broad-cordate, a little pointed. *Stamens* three; the bristles of the foregoing five species are here wanting. *Style* slightly two-cleft. *Seed* three-sided, smooth, white.

9. S. *subarticulatus. R.*

Culms from two to three feet high; culumnar, intercepted with inconspicuous partitions. *Spikes* obtuse, crowded into a head near the base. *Seed* three-sided, pointed.

A native of the same places with the former.

Root resembling that of the preceding species. *Culm* erect, from two to three feet high, round, smooth, naked, intercepted every quarter of an inch by a slight membrane; their places do not appear externally even when the plant is dry. *Leaves* no other than a sheath or two. *Head* lateral, near the base of the culm, sessile, globular, composed of many (about one hundred) small, oval, obtuse, sessile, many-flowered spikes. *Scales* oval, membranaceous. *Seed* three-sided, white, smooth.

10. S. *dubius. R.*

Root tuberous. *Culms* naked, culumnar; intercepted with numerous partitions.

Teling. Allike.

Roots tuberous, with stolones and numerous fibres issuing from them, outwardly of a dark dusky colour, inwardly white. *Leaves* erect, cylindric, smooth, about a foot long.

Obs. I have never met with flowers of this plant which is a native of wet sandy pasture ground, and was formerly considered as a species of *Isoetes*. The natives boil and eat the roots which they say are as good as yams.

11. S. *capitatus. Linn. sp. pl. ed. Willd.* i. 294. *Vahl.* ii. 250.

Culms naked, from four to eight inches high, culumnar. *Spikes* terminal, globular.

I. *Seed* black, roundish, bristle-beset.

216 S. *caribœus. Rottb. gram.* 46. *t.* 15. *f.* 3.

A native of barren, sandy, moist places.

Root fibrous. *Culms* erect, from four to eight inches high, round, smooth, naked. *Leaves* no other than a sheath or two. *Spike* terminal, naked, sub-globular; permanent bristles surround the germ in this species, as in those with single terminal, cylindric spikes. *Style* two-cleft. *Seed* obcordate, compressed, smooth, shining black.

12. S. *juncoides. R.*

Culms from one to three feet high, culumnar. *Spikes* oval, from three to five in a sessile head, far below the apex. *Seed* roundish, beset with bristles.

A native of wet and marshy places.

Root fibrous. *Culms* erect, from one to three feet high, naked, round, and slender in proportion to the height, striated, otherwise smooth. *Leaves* none, except two sheaths embracing the base of each culm. *Spikes* from three to five, lateral, sessile, oval, naked, from four to six inches, below the apex of the culm, which is erect, and like that below the spikes. *Involucre* none. *Stamens* three, intermixed with bristles. *Stigma* two-cleft. *Seed* obcordate, compressed, smooth, white.

13. S. *mucronatus. Linn. sp. pl. ed. Willd.* i. 303. *Vahl. enum.* ii. 256.

Culms from six to twelve inches high, three-cornered. *Spikes* peduncled and sessile below the apex. *Seed* black, scabrous, sub-triangular.

A native of sandy ground.

Root fibrous. *Culms* erect, from six to twelve inches high, firm, naked, three-sided, striated, with rounded angles, above the spikes half round, with a groove on the flat side. *Spikes* lateral, sessile and peduncled, naked, from six to twelve, oblong, many-flowered. *Nectarial bristles* of the germ wanting. *Seed* somewhat three-sided, black, with scabrous spots. Page Carey Ed. I. 217

14. S. *triangulatus. R.*

Culms in tufts, erect, two feet high, naked, acutely three-angled. *Spikes* from eight to twelve, sessile just under the straight three-winged apex. *Germ* embraced by six long, slender bristles, besides the three-broad filaments.

Native of Chittagong, where like most of the order, it delights in low wet ground.

15. S. *supinus. Vahl. enum. sp.* ii. 257.

Culms in tufts, curved, three-cornered, generally naked. *Spikes* several, under the grooved apex, sessile and peduncled. *Involucre* one-leaved, besides the apex of the culm. *Seed* three-sided, transversely rugose on the back, black.

S. *lateralis. Linn. sp. pl. ed. Willd.* i. 302. *Retz. Obs.* iv. 12.

Found growing in tufts, in wet places, in the vicinity of Calcutta, during the cool season.

Root of brown capillary fibres. *Culms* numerous, about a foot high, curved, three-cornered, angles rounded, above the spikes incurved, and deeply channelled. *Leaves* rarely any other than a few short sheaths, investing the base of the culms, and they generally end in an ensiform point, when present solitary and like the culm above the spikes. *Spikes* many, peduncled and sessile, considerably under the apex, oblong. *Scales* ovate, mucronate, with brown chaffy margins. *Seed* three-sided, black, transversely rugose.

16. S. *globulosus. Linn. sp. pl. ed. Willd.* i. 301.

Culms from one to two feet high, nearly culumnar. *Umbel* compound ; *involucre* shorter than the umbel. *Seed* long, obovate, smooth.

Teling. Billapa.

A native of wet sandy places.

Root fibrous. *Culms* erect, from one to two feet high, as thick as a crow-quill, a little compressed, smooth, except near the base which is involved in, from three to five, large, pointed sheaths. *Umbel* terminal, small, compound. *Spikes* oval. *Involucre* two-leaved, unequal, erect, shorter than the umbel. *Filaments* three, broad, and membranaceous. *Style* broad, margins fringed. *Stigma* two-cleft. *Seed* obcordate, compressed, smooth, light brown. I. 218

17. C. *pectinatus. R.*

Culms from three to four feet high, culumnar. *Panicle* lateral, just below the straight subulate apex of the culm. *Scales* daggered. *Stigma* two-cleft. *Seed* roundish, beset with four pinnate bristles.

Grows chiefly in marshy places, where the soil is sandy.

Root fibrous. *Culms* erect, from three to four feet high, as thick as a quill, naked, round, smooth. *Leaves* no other than a sheath or two round the base of each culm. *Umbel* lateral, about its own length below the apex of the culm, compound, rarely decompound, bowing. *Spikes* oblong. *Involucre* no other than the termination of the culm, which is erect and about as long as the umbel. *Scales* chaffy, daggered. *Stigma* two-cleft. *Nectarial bristles* two on each side of the germ they are beautifully pinnate, and permanent. *Seed* obovate, compressed, smooth, brown, embraced by the nectarial bristles.

18. S. *pentagonus. R.*

Culms, from six to nine inches high, somewhat five-sided. *Umbel* terminal, compound ; *involucre* chaffy ; *flowers* monandrous. *Seed* obovate, triangular.

A native of pasture ground.

Root fibrous. *Culms* erect, from six to nine inches high, naked, somewhat five-sided, slightly striated, otherwise smooth. *Leaves* no other than a sheath or two. *Umbel* terminal, compound, small, erect. *Involucre*, a few small chaffy scales, with long tapering points. *Stamens* single. *Stigma* three-cleft. *Seed* somewhat three-sided, white, scabrous. I. 219

SECT. II. *With Leaves.*

19. S. *atropurpureus. Linn. sp. pl. ed. Willd.* i. 294.

Grows in small tufts. *Culms* from three to four inches high, setaceous, erect, culumnar, longer the leaves. *Spikes* terminal, naked, solitary, oval.

A native of poor, wet sandy, pasture land.

20. S. *minimus. R.*

Grows in tufts. *Culms* from one to two inches long, setaceous, curved, shorter than the leaves. *Involucre* three-leaved. *Spikes* terminal, globular, squarrose, about as long as the involucre.

Found with S. *atropurpureus* on poor, wet sandy lands.

21. S. *monostachyos. Kön.*

Culms straight, from six to twelve inches long, culummar. *Spike* terminal, solitary, naked, scales roundish. *Seed* obcordate, smooth.

Delights in barren sandy pasture lands.

Root fibrous, purple-coloured. *Culms* erect, from six to twelve inches high, round, smooth, three-bundles or more naked. *Leaves* sheathing, nearly as long as the culm, filiform. *Spikes* terminal, single, naked, oval ; flowers few. *Scales* sub-orbicular. *Style* broad, with downy margins. *Stigma* two-cleft. *Seed* obcordate, compressed, smooth, light brown.

22. S. *strobilinus. R.*

Culms two feet high, three-sided, base leafy. *Leaves* triangular. *Spikes* lateral, solitary.

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Scales cordate, cuspidate. *Stigmas* two-cleft. *Seed* roundish, beset with bristles.

A native of the soft, wet banks of the Ganges. Flowering time the cool season.

Root stoloniferous with pale-coloured fibres. *Culms* simple, straight, about two feet high, three-sided. *Leaves* two or three, of different sizes, embracing the base of each culm, the longest nearly the length of the culm, keeled and deeply channelled, smooth. *Spike* solitary, lateral, one-third part of the culm below its apex, ovate-oblong, about one inch in length. *Involucre* one-leaved, besides the continuation of the culm, length of the spikes. *Scales* cordate, cuspidate, smooth. *Stamina* three, with about double the number of bristles between them. *Anthers* linear, when old spiral. *Germ* obovate. *Stigma* two-cleft. *Seed* flat, particularly on the inside, roundish, obcordate, crowned with a minute portion of the remaining style, and embraced by about six slender, soft, permanent bristles which are about the same length.

23. S. *scaber. R.*

Culms erect, from four to eight inches high, angular. *Spikes* terminal. *Scales* oblong, diandrous. *Stigma* bifid. *Seed* obcordate, scabrous.

Compare with S. *potytrichoides. Retz. Obs.* iv. *p.* 11.

A native of dry, sandy pasture ground on the coast of Coromandel.

Root composed of dark purple capillary fibres. *Culms* erect, from four to eight inches high, four-fifths naked, angular, smooth. *Leaves* sheathing, mostly radical, filiform, half the length of the culm. *Spike* single, erect, oblong, many-flowered. *Involucre* two or three-caducous scales, shorter than the spike. *Scales* oblong, apex rounded, falling as the seeds ripen. *Stamens* generally two. *Stigma* two-cleft. *Seed* obcordate, compressed, lead-coloured, rugose.

24. S. *bispicatus. Kön.*

Culms erect, from six to twenty-four inches high, filiform. *Spikes* from two to three, terminal, sessile, and peduncled, involucred; *scales* roundish. *Seed* obcordate, with a callous margin.

Teling. Khooshi-tunga.

Beng. Kesoori-mulunga.

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Delights in a moist rich soil, grows in large distinct tufts.

Root fibrous. *Culms* sub-erect, four-fifths naked, very slender, filiform, somewhat five-sided, smooth. *Leaves* sheathing, in large plants long, slender, and often twisted a little, in small plants more rigid. *Spikes* two or three terminal, ovate; one is always sessile, the other one or two peduncled. *Involucre* one or two-leaved, about as long as the peduncled spikes. *Scales* nearly orbicular. *Stamens* and *style* as in S. *monostachyos. Seed* obcordate, compressed, white, with a thick callous margin.

25. S. *schœnoides. Kön. Retz. Obs.* v. 14.

Culms erect, from six to twelve inches long. *Spikes* one or two, terminal, naked, acute. *Scales* pointed. *Seed* obcordate, angular, dotted.

Beng. Moormoori.

A native of dry pasture ground, generally amongst bushes.

Root fibrous. *Culms* sub-erect, from six to twelve inches high, three-fourths naked, filiform, a little compressed, particularly towards the tops, and striated. *Leaves* as in the former. *Spike* generally single, though there are sometimes two, in which case one is peduncled, few-flowered. *Involucre* entirely wanting. *Scales* large, with a large keel and sharp point. *Style* enlarged at the base. *Stigma* three-cleft. *Seed* three-sided, very scabrous, pearl-coloured.

26. S. *tristachyos. Vahl. enum.* ii. 254.

Culms from six to eight inches long, slender, curved, striated. *Leaves* shorter than the culms. *Spikes* from two to four, oblong. *Involucre* two-leaved, one longer than the spikes, apparently a continuation of the culms. *Style* two-cleft, villous. *Seed* obcordate.

A native of Bengal, appears during the cool season in low moist places.

I. 222

Root fibrous, brown. *Culms* numerous, in tufts, slender, variously bent, though nearly erect, slender, grooved, particularly deep on the opposite sides, from six to eight inches high. *Leaves* few, subulate, hard, half the length of the culms. *Spikes* generally three, varying however from one to five, sometimes short-peduncled, oblong. *Involucre* two-leaved; one erect, longer than the spikes, seems a continuation of the culm. *Scales* oval, somewhat mucronate. *Germ* cordate. *Style* villous. *Stigma* two-cleft.

Obs. It differs from Rottboel's plant in having the *scales* mucronate, and the *stigma* two-cleft; yet I think they must be the same.

27. S. *squarrosus. Linn. sp. pl. ed. Willd.* i. 308. *Rottb. gram.* 49. *t.* 17. *f.* 5.

Culms from three to six inches long. *Spikes* three; *involucre* two-leaved. *Scales* ending in a long recurved hairy horn. *Seeds* angular.

Motta-pullu. *Rheed. Mal.* 12. *p.* 72. *t.* 38.

Beng. Goori.

A small delicate species, growing in distinct tufts on dry sandy pasture ground.

Root fibrous. *Culms* numerous, bent in various directions, from three to six inches long, four-fifths naked, round, smooth, filiform. *Leaves* a few only, sheathing, shorter considerably than the culm. *Spikes* terminal, generally three, sessile, oval. *Involucre* two-leaved, the largest about an inch long; being nearly erect, it appears a continuation of the culm. *Scales* numerous, terminating in a long, hairy, recurved point. *Seed* three-sided, oblong, smooth.

28. S. *monander. Linn. sp. pl. ed. Willd.* i. 311. *Rottb. gram.* 50. *t.* 14. *f.* 3.

Culms erect, from three to six inches high, angular. *Head* terminal, of three to five spikelets; *involucre* from two to three-leaved; *scales* acute, monandrous. *Seed* roundish, angular.

A native of sandy pasture ground.

Root consisting of capillary fibres. *Culms* naked, straight, from three to six inches high, angular, smooth. *Leaves* filiform, as long as the culm, woolly near the mouth of the sheaths. *Head* terminal, sessile, composed of from three to five small, sessile, few-flowered spikes. *Involucre* from two to three-leaved. *Scales* pointed. *Stamen* single. *Stigma* three-cleft. *Seed* three-sided, short, thick, smooth, white. 223

29. S. *antarcticus. Linn. sp. pl. ed. Willd.* i. 310. *Vahl. enum.* ii. 261.

Culms erect, from three to six inches high, round. *Head* terminal, of many spikelets. *Involucres* from two to three-pointed. *Seed* three-sided.

Grows on sandy pasture ground.

Root fibrous. *Culms* erect, from three to six inches high, round, smooth. *Leaves* radical, embracing the base of the culms, sheathing, half the length of the culm. *Head* or *umbellet* terminal, globular, composed of numerous small, sessile, few-flowered, conical, pointed spikes. *Involucre* from two to three-leaved, scarcely the length of the head. *Scales* pointed. *Seed* three-sided, smooth.

30. *argenteus. Kön. Rottb. gram.* 51. *t.* 17. *f.* 6. *Linn. sp. pl. ed. Willd.* i. 311.

Culms sub-erect, from four to eight inches high, semi-culumnar. *Head* terminal, of many sub-sessile spikelets. *Involucres* from two to three; *scales* obtuse, monandrous. *Seed* roundish, compressed.

Fimbristylis argentea. *Vahl. enum.* ii. 294.

Found on sandy pasture ground, growing in large tufts, with the exterior culms of the tuft curved.

Root fibrous. *Culms* erect, or ascending, mostly naked, from four to eight inches high, round on one side, and flattened on the other, sometimes with a groove on the flat side. *Leaves* as in the former species. *Head* or *umbellet* terminal, composed of from fifteen to twenty cylindrical, obtuse, sessile, silver-coloured, many-flowered spikes. *Involucre* two, three, or four-leaved, unequal. *Scales* oblong, obtuse; *keel* green, the rest silver-coloured. *Stamen* single. *Stigma* two-cleft. *Seed* obcordate, compressed, smooth, pearl-coloured. I. 224

31. *glomeratus. Linn. sp. pl. ed. Willd.* i. 296.

Culms six inches high, semi-culumnar. *Leaves* numerous, from one to two inches long. *Umbel* composed of from six to twelve ovate spikelets. *Involucres* and *involucels* the length of the spikelets.

Hind. Bura Nirbishee.

Native of Coromandel and Bengal.

32. S. *arvensis. Retz. Obs.* iv. *p.* 11.

Culms from six to twenty-four inches high, compressed, furrowed. *Leaves* tortuose. *Umbel* simple. *Involucre* one or two-leaved, shorter than the umbel. *Scales* obtuse, diandrous. *Seed* obcordate, striated and dotted.

A native of various parts of India, appearing in low moist places during the rainy season.

Culms about six inches high, compressed, and furrowed. *Leaves* radical, or surrounding the lower portion of the culms, narrow, a little twisted, and nearly as long as the culms. *Umbel* generally simple, of from four to six sessile, or pedicelled, ovate-oblong brown spikes; sometimes one of the pedicels supports two spikes. *Involucre* one or two-leaved, small and shorter than the umbel. *Scales* of the spikes ovate, chaffy. *Stamens* two. *Style* thick at the base; *apex* two-cleft, and villous. *Seed* obcordate, furrowed longitudinally, and dotted with white on a brownish ground.

33. S. *tenellus. R.*

Culms twelve inches high, leafy, sub-cylindric. *Umbels* thin, scarcely compound. *Involucres* minute. *Style* with enlarged base. *Stigma* three-cleft. *Seed* obovate, dotted, pearl-coloured.

A native of Coromandel. I. 225

Culms many, uncommonly slender, erect, about a foot high, toward the base invested with the sheaths of a few slender leaves. *Umbel* very thin, composed of one sessile, oblong spike, and of from six to twelve or about half the number of pedicels of various lengths. *Involucres* minute, the longest scarcely exceeding the sessile spike. *Scales* boat-shaped, scariose, with a short point. *Style* swelled at the base to the full size of the germ; this swelled part, however, is not more permanent than the rest of the style. *Stigma* trifid. *Seed* obovate, obscurely three-sided, much dotted, pearl-coloured.

34. S. *tridentatus. R.*

Culms straight, from two to five feet high, angular. *Umbel* compound; *involucres* from two to three; *spikelets* pointed; *scales* lapped, jagged and daggered. *Seed* roundish, three-angled, and bristly.

Compare with S. *maritimus.*

Teling. Goorapa-shaka-tunga.

Grows in water courses, ditches, &c. where the water is fresh; never in salt, or brackish water.

Root stoloniferous with some small tubers, and many fibres. *Culms* erect, rigid, leafy, jointed, from two to five feet high, three-sided, smooth, angles sharp. *Leaves* numerous, sheathing, sub-erect, rigid, keeled, smooth. *Umbel* compound, small for the size of the plant. *Involucre* from two to three-leaved, erect, unequal, the longest being three times the length of the umbel, and the shortest equalling the latter. *Spikes* lanceolate or cylindric, large; some sessile, some peduncled. *Scales* three-toothed, the lateral ones torn, the middle long and sub-

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ulate, keel green, the rest rust-coloured. *Seed* three-sided, short, thick, smooth, with bristles round the base.

Obs. I believe König called it S. *maritimus indicus*, but the form of the seeds and jointed culm, will, I think, render it a very well marked and distinct species.

I. 226 35. S. *strictus*. *R.*

Culms straight, from twelve to eighteen inches high, culumnar. *Umbel* compound. *Involucres* chaffy; *scales* obtuse, diandrous and roundish, compressed.

Grows on a moderately dry, hard, barren, sandy soil.

Root fibrous. *Culms* straight, naked, rigid, from twelve to eighteen inches high, round, very smooth. *Leaves* radical, short, rigid, but smooth. *Umbel* terminal, sometimes decompound, contracted, seldom more than two inches long, and one broad. *Involucre* from two to four, small, chaffy, tapering sheaths. *Spikes* ovate, small, many-flowered. *Scales* with a broad, white, membranaceous border. *Stamens* two. *Stigma* two-cleft. *Seed* much compressed, obcordate, dotted with brown.

36. S. *brevifolius*.

Culms erect, from six to eight inches high, semi-culumnar. *Umbel* decompound; *involucels* chaffy; *scales* cuspidate, monandrous. *Stigma* bifid. *Seeds* obcordate, striated.

Is found generally on low sandy pasture ground.

Root fibrous. *Culms* erect, mostly naked, from six to eight inches high, flat on one side and rounded on the other. *Leaves* sheathing, short. *Umbel* terminal, decompound. *Involucre* from two to three-leaved, shorter than the umbel. *Spikes* small, oblong; while young sessile, but when old appearing peduncled, the scales and seeds gradually dropping off and leaving the rachis naked. *Scales* keeled and pointed. *Stamen* single. *Style* broad, enlargened at the base; above, the margins are hairy. *Stigma* two-cleft. *Seeds* obcordate, convex on the outside, flat on the inner, white, striated.

Obs. The single stamen and striated seed are the best specific marks. It much resembles Rottboel's figure of S. *dichotomus*, but that species is described by Vahl as having three
I. stamina: (see *Fimbristylis dichotoma, enum.* ii. *p.* 227.) consequently they must be different.

227 37. S. *aestivalis*. *Retz. Obs.* iv. 12.

Spikes rounded, sub-squarrose; *involucre* six-leaved, longer than the compound umbel; *scales* monandrous. *Vahl. enum.* ii. 288. *(under Fimbristylis.)*

I received this elegant little grass from Nepal*a* where it grows in low fields during the rainy season.

38. S. *diphyllus*. *Linn. sp. pl. ed. Willd.* i. 301.

Culms erect, from one to two feet high, semi-culumnar. *Umbel* decompound; *scales* obtuse, diandrous. *Seeds* roundish, obcordate, smooth.

Fimbristylis diphylla. *Vahl. enum.* ii. 249.

Delights in a rich wet soil.

Root fibrous. *Culms* erect, seven-eighths naked, from one to two feet high, sometimes a little compressed. *Leaves* chiefly radical, half the length of the culm, rigid. *Umbel* terminal, decompound. *Involucre* two or four-leaved, the larger about the length of the umbel; *partial involucres* small; *spikes* numerous, oblong, some sessile, some peduncled, exclusive of the naked rachis of those that are old, dark brown. *Scales* oblong, obtuse, dark brown. *Stamens* two. *Stigmas* two-cleft. *Seed* obcordate, much compressed, smooth, brown.

39. S. *miliaceus*. *Linn. sp. pl. ed. Willd.* i. 305. *Rottb. gram.* 57. *t.* 5. *f.* 2. *Retz. Obs.* 5. 16.

Culms erect, from one to two feet high, semi-culumnar. *Umbel* decompound. *Involucres* and *involucels* shorter than the umbels and umbellets. *Seed* obcordate, striated.

Fimbristylis miliacea. *Vahl. enum.* ii. 287.

This species delights in wet pasture ground.

Root fibrous. *Culms* erect, from one to two feet high, seven-eighths naked, generally round, though sometimes a little compressed, and chiefly near the apex striated, otherwise smooth. *Umbel* decompound, very thin. *Involucre* three or five-leaved, unequal, but the
I. largest is seldom so long as the umbel. *Involucels* like the involucre, but much smaller.
228 *Spikes* sessile, or peduncled, oval, rust-coloured, many-flowered. *Scales* broad, a little pointed very concave. *Stamens* two or three. *Style* enlarged at the base, broad, with hairy margins. *Stigma* two-cleft. *Seed* obcordate, compressed, pearl-coloured, striated, without bristles.

40. S. *complanatus*. *Vahl. enum.* ii. 279. *Retz. Obs.* 5. 14.

Culms sub-erect, from one to two feet high, edged. *Umbel* from compound to super-decompound. *Involucre* two-leaved, erect; *scales* lanceolate. *Seed* obcordate, dotted.

Hind. Kuratiya-juvani.

A native of moist or wet places.

Root fibrous. *Culms* nearly erect, but waving a little, from one to two feet high, naked except at the base, compressed, two-edged; edges sharp, and turned different ways, striated, smooth, often a little twisted. *Leaves* radical, or embracing the base of the culm, nearly as long as the culm, linear, waved, often a little twisted, apex abrupt. *Umbel* super-decompound, dense. *Involucre* two-leaved, opposite, erect, unequal, the longest about the length of the umbel. *Involucels* chaffy, ending like bristles. *Spikes* sessile, or short-pedicelled, oblong, few-flowered.

Scales rust-coloured, acute. *Seeds* obcordate, rugose, white.

41. S. *tetragonus*. *R.*

Culms from one to two feet high, four-angled. *Umbel* decompound and super-decompound. *Involucre* and *involucels* bristly; *scales* roundish, diandrous. *Seed* round.

Hind. Bura-juvani.

Teling. Murcushalee.

Grows with the other species on moist pasture ground. Page Carey Ed.

Root fibrous. *Culms* nearly erect, from one to two feet high, naked, except at the base, four-sided, smooth. *Leaves* radical, and about the base of the culm, bifarious, tapering, nearly as long as the culm. *Umbel* super-decompound, rather thin, and of an irregular form. *Involucre* and *involucels* small, bristle-like. *Spikes* minute, globular, many-flowered. *Stamens*, from one to two, rarely three. *Stigma* two or three-cleft. *Seed* nearly globular, compressed on the inside, scabrous, white. I. 229

42. S. *quinquangularis. Vahl. enum.* ii. 279.

Culms from one to two feet high, five-angled. *Umbel* super-decompound; *involucre* much shorter than the umbel; *scales* oval, monandrous. *Seed* three-sided, rugose.

A native of similar places with the last species.

Root fibrous. *Culms* as in *complanatus*, and *tetragonus*, and of the same height, but in this species always five-sided. The angles sharp and the sides concave. *Leaves* as in S. *complanatus. Umbel* super-decompound, rather thin, and unequal as in Sc. *tetragonus. Involucre* three-leaved, the largest about the length of the umbel. *Spikes* mostly pedicelled, oval, very small, few, from six to eight-flowered. *Scales* oval. *Stamen* one. *Stigma* three-cleft. *Seed* oblong, three-sided, rugose.

43. S. *pallescens. R.*

Culms from six to ten inches high, culumnar. *Umbel* super-decompound, rather shorter than the involucre, monandrous. *Scales* obtuse. *Seed* obcordate, without angles, streaked and wrinkled.

A native of low pasture ground.

Root fibrous. *Culms* nearly erect, from six to ten inches high, mostly naked, nearly round and striated. *Leaves* sheathing, as long as the culm, concave; edges slightly serrulate, somewhat woolly. *Umbel* terminal, super-decompound, large in proportion to the rest of the plant. *Involucre* two-leaved, nearly erect, opposite margins slighly serrulate, longer than the umbel, a few small scales intermixed. *Spikes* very minute. *Scales* oval, concave. *Stamens* solitary. *Style* two-cleft. *Seed* obcordate, a little compressed, striated longitudinally, and wrinkled transversely. I. 230

44. Sc. *anceps. R.*

Culm erect, twelve inches high, two-edged. *Involucre* two-leaved, shorter than the super-decompound, four or five times-divided umbel.

Beng. Joopi.

A native of Bengal.

45. Sc. *Kysoor. R.*

Culms from five to six feet high, triangular, and hispid. *Umbel* super-decompound. *Spikes* ovate. *Seed* oblong, three-sided, crowned, and beset with five villous bristles.

Beng. Kesoor or Kesooree.

Common in Bengal, growing on the borders of lakes, ponds, &c. of fresh water, in flower during the latter part of the rains.

Root tuberous, with numerous ferruginous fibres. *Culms* straight, from four to six feet high, three-angled, the sides deeply grooved and the angles very sharp, and backwardly hispid. *Leaves* several to each culm, and about their length, sheathing at the base, above that part deeply channelled, with the margins and keel while young, somewhat hispid, and the points long and subulate. *Umbel* terminal, super-decompound. *Involucre* about three, very unequal, the largest from one to two feet long, and the shortest as many inches; resembling the leaves in form. *Spikes* ovate, brown. *Scales* roundish oval, concave, chaffy, brown, smooth; the rib or nerve ending in a subulate point beyond the rounded apex. *Stamens* three on the exterior side of the germ, one-bearded bristle between each filament, and three on the back, making in all five. *Germ* ovate. *Style* with swelled, permanent, cordate base. *Stigma* three-cleft. *Seed* oblong, three-sided, surrounded by the five-bearded bristles.

Obs. It approaches Sc. *grossus. Vahl. enum.* ii. 270; the best marks to distinguish them by, are the bristles which embrace the germ, and continue with the seed; here they are five in number and villous, there six, and barbed, or armed on the margin, with sharp bristles pointing backward. My Sc. *maximus* is a much larger species, and the germ destitute of bristles. I. 231

46. Sc. *grossus. Vahl. enum.* ii. 270.

Culms erect, from six to ten feet high, triangular. *Umbel* super-decompound. *Seed* three-sided, beset with six, backwardly hispid bristles.

Exclude Sc. *grossus. Retz. Obs.* v. 15, which I presume is my Sc. *maximus;* the germ and seed being there destitute of the bristly involucre. To which of these Sc. *grossus*, Linn. *Suppl.* ought to be referred, I cannot say.

This, next to Sc. *maximus*, is by far the largest species I have ever met with. It grows in standing sweet water.

Culm erect, mostly naked, from six to ten feet high, three-sided; *angles* sharp, *sides* concave. *Leaves* radical, and round the base of the culms sheathing, much keeled, almost as long as the culms; edges slightly scabrous. *Umbel* super-decompound, five or eight inches each way. *Involucre* three-leaved, the largest about two feet, the shortest six inches, they taper to a long, acute point; margins pretty smooth. *Involucels* chaffy. *Spikes* oblong, dark-brown, many-flowered. *Stamens* three, with two bristles between each pair. *Style* three-cleft. *Seed* three-sided, embraced by the six enlarged bristles, which are armed on the edges with stiff, bent back, short hairs.

47. Sc. *maximus. R.*

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Culms straight, from six to fifteen feet high, triangular. *Umbel* decompound; *spikelets* roundish. *Seed* obcordate, three-sided, without bristles.

Sc. *grossus. Retz. Obs.* v. 15. and probably Linn. *Suppl. p.* 104.

Teling. Booda-tunga.

I. 232 Is found only in pretty deep, standing, sweet water.

Root fibrous, and stoloniferous. *Culms* erect, most rigid, naked, except at the base, from six to fifteen feet high, and from one to two inches in diameter, three-sided; *angles* very sharp; *sides* somewhat concave. *Leaves* mostly radical, almost as long as the culm, much keeled, (a transverse section appears like the letter V,) smooth, inside only a little striated. *Umbel* superdecompound, generally about a foot long. *Involucre* from three to four-leaved, the largest from three to four feet long, the smallest from three to four inches, smooth. *Involucel* chaffy. *Spikes* minute, ovate, few-flowered. *Scales* broad, and short. *Stamens* three. *Stigma* three-cleft. *Seed* three-sided, without bristles, which easily distinguishes it from the last Sc. *grossus.*

Obs. I have not in any of the foregoing genera of *Cyperoideæ* taken notice of the sheaths which embrace the base of the peduncles and pedicels of the umbels, and their subdivisions; because they are common to all, and so much alike, that I do not think they can convey any information. Nor have I attended to the form of those peduncles and pedicels; because I have not found it uniform. The culm, inflorescence, involucre, and seed, are I think, the best marks to discriminate the species by, particularly the culm and seed. The number of stamens and divisions of stigma, sometimes vary even in the same plant, much more in different plants of the same species.

Nearly the whole of the plants belonging to the six foregoing *genera* (called *Calamariæ* by Linnæus and *Cyperoideæ* by Jussieu) are natives of low, barren, moist places, and borders of rice fields on the coast of Coromandel. They appear, blossom, and ripen their seed during the rains, and the beginning of the cool season. They are in general rejected by cattle.

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TRIANDRIA DIGYNIA.

PEROTIS. Schreb. gen. N. 1714.

Calyx none. *Corol* two-valved; *valves* equal, and awned.

1. P. *latifolia. Linn. sp. pl. ed. Willd.* i. 324.

Culms piped, from nine to eighteen inches high. *Leaves* short, waved, and ciliate. *Raceme* cylindrical.

Tsjeria-kuren-pulla. *Rheed. Mal.* 12. 117. *t.* 62.

Anthoxanthum indicum. Linn. sp. pl. ed. Willd. i. 157.

Saccharum spicatum. Linn. sp. pl. 79.

Is a native of high, dry, sandy, barren ground, over the coast of Coromandel.

Root fibrous. *Culms* at the base resting on the ground, and there branchy, above erect, leafy, jointed, from nine to eighteen inches high, smooth. *Leaves* sheathing, short, broad at the base, margins waved and hispid; sheaths about half the length of the joints. *Racemes* (not spikes) terminal, erect, cylindrical, lead-coloured. *Flowers* numerous, diverging. *Calyx* two-valved, both awned, and are totally destitute of hairs round their base, or any where else. *Corol* two-valved, very minute. *Seed*..... ...

Obs. Cattle are not fond of this grass.

CENCHRUS. Schreb. gen. N. 1574.

Involucre echinate, and four-flowered. *Calyx* from two to three-valved, one or two-flowered.

1. C. *biflorus. R.*

Spikes simple, cylindric. *Involucres* two-flowered; *segments* subulate, hooked and hairy within.

A native of the interior, elevated, dry parts of the Coromandel coast.

I. 234 *Culms* straight, from six to twenty-four inches high, smooth. *Leaves* long, slender, somewhat scabrous; mouths of their sheaths a little hairy. *Spikes* terminal, solitary, simple, cylindric, from three to four inches long. *Rachis* flexuose, three-sided. *Flowers* numerous, solitary, alternate. *Involucre* two, rarely one-flowered, multifid, divisions longer than the flowers, subulate, grooved on the back, inside hairy, apex slightly hooked. Both flowers hermaphrodite. *Calyx* three-valved, one-flowered, the exterior one smaller, all are thin, smooth, nerved. *Corol* two-valved, valves hard, acute, but not awned, in length nearly equal, and scarcely longer than the calyx. *Stamina* three. *Styles* two, plumose.

SACCHARUM. Schreb. gen. N. 104.

Calyx one-flowered, two-valved, girt at the base with wool; *corol* uncertain.

1. S. *cylindricum. Linn. sp. pl. ed. Willd.* i. 323.

Culms from one to two feet high, shorter than the leaves. *Panicles* linear, white with the wool of the calyx. *Corol* and *calyx* two-valved and diandrous.

Lagurus *cylindrica. sp. pl.* 120.

S. *Thunbergi. Linn. sp. pl. ed. Willd.* i. 323. *Retz. Obs.* v. *p.* 17.

Gramen caricosum. *Rumph. Amb.* 6. 17. *t.* 7. *f.* 2.

Beng. Ooloo.

Teling. Baroombiss.

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Is a native of moist, stiff, pasture ground, and particularly common over Bengal, where the fields are white with it when in flower, after the first rains in April and May.

Root creeping at some depth under the surface. *Culms* erect, simple, from one to two feet high, leafy, jointed, joints bearded. *Leaves*, those of the root or lower part of the culm are much longer than the culm, tapering equal towards each end, smooth, those of the culm are little else than sheaths. *Panicles* terminal, cylindric, from three to four inches long, composed of small, erect branchlets, of a bright cotton-like whiteness, from the quantity of wool that surrounds the insertion of the flowers. *Flowers* pedicelled, generally simple. *Calyx* two-valved, with here and there a long white hair. *Corol* two-valved, minute. *Stamens* two.

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Obs. Cattle are not fond of it, particularly when old. It is used in the marriage ceremonies of the Telingas. In Bengal it is much used for thatch.

2. S. *spontaneum. Linn. sp. pl. ed Willd.* i. 321.

Culms from five to fifteen feet high. *Leaves* involute when dry. *Panicle* linear, spreading, verticelled; *ramification* simple; *calyx* ciliate. *Corol* one-valved.

Sans. Kasha.

Hind. Kagara.

Teling. Rellòo-gaddy.

Grows on the banks of rivers, in hedges, and on moist, uncultivated land; in a good soil, it is frequently from ten to fifteen feet high, in a poorer soil, from five to ten.

Root perennial, creeping very deep in the ground. *Culms* annual, erect, leafy, round, lower parts perennial, and as thick as the finger, annual shoots about as thick as a common quill, solid, height various as above observed. *Leaves* sheathing, remarkably long and narrow, but firm; margins hispid; a transverse section appears crescent; sheaths with their mouths woolly. *Panicles* terminal, spreading, erect, oblong, from one to two feet long, composed of verticelled, filiform, simple, (except the lower verticil or two.) spiked racemes; *spiked*, because half the flowers are sessile, and half pedicelled. The immense quantity of long, bright, silver-coloured wool, which surrounds the base of the flowers gives this species a most conspicuous, gaudy appearance. *Flowers* paired, one-pedicelled, the other sessile. *Calyx* two-leaved; margins ciliate, acute, surrounded, with many soft, very long, silver-coloured hairs. *Corol* one-valved, ciliate, acute, membranaceous. *Stigma* feathery, purple.

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Obs. I have not seen the ripe seed. It is so very coarse that cattle do not eat it, except while very young. It makes good mats for various purposes, and is used to thatch houses.

3. S. *fuscum. R.*

Erect, five to eight feet high. *Leaves* sub-lanceolate, smooth. *Panicle* spreading, verticelled; *ramifications* compound. *Flowers* paired, both pedicelled, wool of the calyx short and scanty. *Corol* three-valved.

Beng. Khuree or Pata Khuree.

A native of damp places over Bengal. Flowering time the rainy season.

Culms erect, from five to eight feet high, as thick as the little finger, hairy near the top. *Leaves* sheathing, linear-lanceolate, smooth in every part, except the margins of the sheaths, which are fringed with much soft hair; length about three or four feet, breadth about, or under two inches. *Panicles* from one to two feet long, erect, linear, verticelled, except towards the apex; *ramifications* compound; *ramule* nodding. *Flowers* paired, one short-pedicelled, the other longer, both hermaphrodite; wool of the pedicels, &c. short and in small quantity. *Calyx* with ciliate margins, otherwise smooth and shining. *Corol* three-valved, of which two are equal and nearly as long as the calyx, the third minute, all much ciliated. *Seed* long, obovate, brown, smooth.

Obs. The natives make their pens of the culms of this and the following species, and use it for screens and light fences.

4. S. *semidecumbens.*

Lower portion of the culms procumbent, and perennial, *Leaves* narrow, channelled. *Panicle* oblong, lax, with compound verticelled ramifications; *corol* one-valved.

Beng. Khuree.

A native of Bengal, where it delights in low wet places, blossoms about the close of the rains, and the beginning of the cold season.

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Root perennial. *Culms* of great length, i. e. from eight to sixteen or more feet long, one half or more, generally resting on the ground, and striking roots at the joints; this portion is often as thick as the little finger, and perennial; the extreme portion erect, straight, and taper to the thickness of a crow-quill at the panicle; filled with pith in every part. *Leaves* from one to six feet long, very slender, pointed, channelled, bottom of the channel white, margins most acutely hispid, mouths of the sheaths and for some way above them bearded with much soft white hair. *Panicles* ovate, or oval, erect, large. *Ramifications* coloured, verticelled, compound. *Flowers* approximate, paired; one sessile, the other pedicelled, both girt with much, pure white, soft hair. *Calyx* two-valved; inner valve ciliate. *Corol* one-valved, ciliate.

5. S. *Officinarum. Linn. sp. pl. ed. Willd.* i. 321.

Culms from six to twelve feet high. *Leaves* flat. *Panicle* ovate, spreading; *branches* alternate, decompound. *Corol* one-valved.

Sans. Ikshoo, Rusala, the light-coloured varieties; Poondra, and Kangaruka, the red

Beng. Ikh, Ooh, Ak, Koosheear, also Poori and Kallooa the two pale varieties, and Kajooi the red.

Page Carey Ed.

Teling. Cherukoo-bodi, or Cherukoo-duboo.

Where wild, I do not know. *Panicles* terminal, spreading, erect, oblong, from one to three feet long, of a gray colour, from the large quantity of long soft hair that surrounds the flower. *Ramifications* alternate, very ramous, expanding. *Rachis* striated. *Flowers* hermaphrodite, in pairs; one sessile, the other pedicelled. *Calyx* two-leaved, smooth. *Corol* one-valved, smooth, membranaceous, rose-coloured. *Stamens* and *pistil* as in the genus. I have not seen the seed.

Obs. It is much cultivated in the Rajamundri Circar, where they only make a coarse
I. sort of brown raw sugar, which is sold on the spot for about three half-pence per pound. The
238 cane is cultivated on their best lands, which can be easily watered; but, unless the farmer pleases, not easily flooded during violent rains.

The land is first well ploughed during the month of April and beginning of May. The field is then flooded from the river, if there is not sufficient rain; the upper part of the cane is then cut into two lengths of one or two joints each, (the lower part of the same canes are employed to make sugar from) these are placed over the wet field, at about fifteen or eighteen inches asunder, in rows, the rows about four feet from one another, and trode under the soft wet surface with the foot; in six days after the planting, the field is again flooded, if if there has not been rain. In about eight days more the shoots appear; the land is soon after slightly hoed and weeded. A month after the planting some rotten chaff, or other such manure, is scattered about the young plants. Every ten or fifteen days, if there be not sufficient rain, the field is watered; two months from the planting, some stronger manure is strewed about the plants; and every fifteen or twenty days the field is slightly hoed, and the weeds rooted out.

During the wet season, drains must be made, to carry off the superabundant water. By August or September, the cane will be from three to five feet high; in each shoot, the produce of every cutting, which may contain from three to six canes, a straight bamboo is stuck into the earth, in the centre; to this the canes are tied by their leaves. In this country the leaves are never stript from the cane, but as they wither are tied round them. This must impede the free circulation of air, which may be conceived hurtful. In January, viz. between nine and ten months from the time they were planted, the cane, when stript of its leaves, and the useless top cut off, will be about as thick as a good stout walking cane, and from four to six feet long; they then begin to cut the cane, express the juice, and boil the sugar, which is with the natives here, a very simple process; a small mill turned by cattle squeezes the cane, and
I. one boiler boils it.
239 In Bengal there are three varieties cultivated, viz. The above described or common yellow cane, called by the Bengalees *Poori*. Secondly, the purple cane called by them *Kajooli*, which is said to yield juice one-eighth part richer than the yellow cane; but the sugar thereof is always of a dark colour. The third and last, is a very large, light-coloured cane, called *Kullooa*, which grows in a low swampy soil, where neither of the other two will succeed; its juice is still weaker than that of the yellow cane; but it has these advantages, that it grows to a much larger size, and where neither of the other two will thrive. It is therefore much cultivated, because the other sorts planted on higher situations are apt to suffer from drought.

6. S. *sinensis. R.*

Culms from six to ten feet high. *Leaves* flat, with margins hispid, panicles ovate, with simple and compound verticelled branches. *Corol* of two valves on the same side.

Stem erect, jointed, whole height from ten to fifteen feet; the greatest part covered with the sheaths of the leaves; *joints* from four to eight inches long, and from two to three inches in circumference, colour pale brownish yellow. *Leaves* sub-bifarious, tapering from the base, to a long, fine, point; plain, smooth on both sides; margins armed with numerous, small, very acute spines pointing forward, length from two to three feet, and about an inch and a half broad at the base. *Sheaths* smooth, with a small ligula, or stipulary ring round the inside of the mouth. *Panicle* ovate, erect; branches, simple and compound, sub-verticelled, reclinate, long and slender. In S. *officinarum* the branches of the panicle are scattered over the common rachis and are decompound, and super-decompound; on this I rest the most obvious specific deference, independent of the additional small inner scale, or valve of the
I. corol. *Calyx*, and its surrounding wool, as in the genus. *Corol* of the two valves on the
240 same (anterior) side, the inner one very small. *Nectary* of two, large, broad, cuneate, crenulate, fleshy scales, which occupy the two posterior sides of the germ, opposite to the two valves of the corol.

Obs. This new species, for such it appears to me, was introduced from China into the Botanic garden, at the close of the year 1796, in hope of finding it in some respects better than the common cane cultivated over India. It promises considerable advantage; particularly from its being so solid, and hard, as to resist the forceps of the white ants, and the teeth of the jackal, two great enemies to our East Indian sugar plantations. At the same time it bears drought much better than the sorts in general cultivation. It produces a profitable crop even to the third year; while the common cane of India must be renewed every year. It is also said to yield juice of a richer quality.

This seems to be the sort employed over China for making their sugars, as appears from the following extract of a letter from Mr. A. Duncan, surgeon to the factory at Canton, to Richard Hall, Esq. President, &c. of the Select Committee, dated Canton 26th October, 1796, which accompanied plants of this cane from China; explaining the mode of cultivation and manufacturing the sugar in the province of Canton.

"*Sugar canes.* A first and second sort are cultivated in the province of Canton; the

former being small, compact and highly saccharine, is manufactured into sugar, whereas the latter, being of a larger size, and looser texture, is generally cut into joints, and eaten by the natives, either raw, or gently heated. Page Carey Ed.

"The culture of sugar canes commences about the middle of March or beginning of April, in proportion to the temperature of the weather, when a good, light, sandy soil is thrown up into beds of about four feet diameter leaving intermediate spaces of one and a half, which serve as drains and passes for the husbandmen. A composition of human manure and water is thrown over the beds; after which the tops of sugar canes, fifteen inches long, (the Chinese are here economical) are planted in a slanting position, and occasionally watered at sun-set, till the young shoots rise a cubit high; when the husk and refuse of the ground nut, or of some oleaginous seeds after the oil is extracted, are well beaten into a kind of powder and put round the root of the plants, in small quantities, and afterwards covered over with earth. The canes are now left to the fertility of the soil till they arrive at maturity, except when it proves such a dry season, that watering becomes requisite, and are cut down about the 1st of November. The first sort planted in the foregoing manner, generally yields three crops while the second requires fresh planting. I. 241

"The sugar canes are now removed from the ground to the mill for expression. The juice, being extracted, is carefully strained, mixed with a small quantity of lime water, then poured into large warm iron pans, placed on a platform of brick work, with fire places below; it is now boiled for a length of time, and being removed from the fire, and allowed to cool, it is a second time strained, and being again returned to the pans the boiling is repeated for once, or twice, till it acquires a saccharine consistence. The sugar, still very moist, is now put into cylindrical jars, which have a small hole in each of their bottoms, for the purpose of draining; and their tops being covered over with from half an inch to an inch of clayey moist earth, these are placed on stands, and remain for three or four days; when the old earthen covering is removed, and a fresh one put on. They continue in that situation for three or four days more, the covering is then taken off, and the sugar being sufficiently clarified is removed from the jars, and spread out on flat baskets, exposed to the sun till dry, when it is fit for use.

"The mill for expressing the juice, of which I have sent a very exact miniature model, appears so far as I recollect, preferable to those used in India. The machine is wrought by a buffalo yoked to the small end of the crooked beam, while its thick end is fastened to the long axle of one of the cylinders. The canes having undergone one expression, and being consequently in a split state, are not thrust a second time through till all the irons are greased. The cylinders are not always of the same dimensions; those I examined were two cubits high, and one and two-thirds in diameter, these are the common size; I am however told they are sometimes much larger." I. 242

To point out the benefit that may accrue to the cultivators of this sugar cane, I need only add the following copy of a letter from Mr. Richard Carden, superintendent of the Honourable Company's rum and sugar works at Mirzapore Culna in Bengal, to me, dated 13th August, 1801, soon after the introduction of the cane.

"With respect to the produce of the common Bengal sugar canes, I have never been able to collect an account that can be depended upon; the natives generally manufacture the juice into Jaggery in my neighbourhood, which yields them nearly 14 cutcha maunds, of 60 sicca weight, per bigha on an average; and a profit of about 11 or 12 rupees per bigha. Neither the white ants nor jackals have committed any depredations on the China canes that I have planted, although the latter have often been seen among them, which certainly gives these canes a decided preference to the Bengal sugar canes. I do not think the China ones degenerate in the least, nor do they improve; they appear to me to remain nearly in the same state. If planted at the same time the natives put their canes into the ground, they will not make such good returns as the Bengal sort, but planted in the West India mode, in the month of September or October, and suffered to remain on the ground till the December or January twelve months, they will then yield double the returns of what the Bengal canes do, which is owing in part to the length of time they are in the ground, and principally to the ants and jackals not destroying them, whereas if the Bengal cane was to remain so long on the ground, the natives would have great difficulty to prevent the greatest part of them from being destroyed, and the young shoots would suffer very much from the hot winds, and ants, which I witnessed the second year I came to Mirzapore; but the shoots from the China canes I cut last January, stood the last hot season uncommonly well, and will next January, I have reason to believe, from the present appearance, make half, or nearly three-fourths the quantity of sugar they did last January; and that with the trifling expense of clearing the ground twice; cutting, and manufacturing the juice. I should be extremely happy to have sent you a more particular account, but that is not in my power, as the native statement is not to be depended upon. I did purchase twelve cottas of the best Bengal canes last January, merely as an experiment, which yielded just half the quantity of sugar my China canes did." I. 243

7. *S. procerum. R.*

Perennial, from ten to twenty feet high, erect. *Leaves* ensiform, with a white rib, and hispid margins. *Panicle* diffuse, with verticelled, compound and decompound branches. *Corol* of the pedicelled flower two, and of the sessile three-valved, with the inner one retuse

Beng. Teng.

A native of Bengal, and by far the most beautiful of the genus I have yet met with. It [illegible] in appearance to *S. Officinarum*, but is a taller and much more elegant plant.

Culms perennial, straight, simple till the second or third year, then branchy, about as

Page Carey Ed. thick as a slender walking cane; joints from six to twelve inches long, and filled with insipid pith; height of the whole plant, when in flower from ten to twenty feet. *Leaves* from three to five feet long, tapering to a long and very fine point, the greatest breadth is at one or two feet above the sheath, and is there from one to two inches; nerve white, margins hispid. I. 244 *Sheaths* bearded round the mouth, and at their insertion on the outside. *Panicles* large, from one to two feet long, ovate, erect, composed of numerous expanding, sub-verticelled, compound, woolly branches, when in blossom much expanded, afterwards they become erect, and pressed in on the common rachis, forming a dense cylindrical panicle, and I have repeatedly observed this variation in the form of the panicle at different periods, to run through the whole genus. *Flowers* in parts, one sessile, the other pedicelled. *Calyx* purple, woolly. *Corol* of the sessile flower three, of the pedicelled two-valved, all are exceedingly delicate, and the third valve of the sessile flower is retuse.

Obs. The seeds or culms are long, strong and straight, and employed by the natives for skreens, and various other economical purposes.

8. S. *Sara. R.*

Erect, from eight to twelve feet high. *Leaves* flat with prickly margins. *Panicles* dense, sub-verticelled; *ramifications* decompound. *Flowers* paired, one of the pair sessile. *Corol* three-valved.

Sans. Goondra, Tejunuka, Shura.

Beng. Shur.

Sara. *Asiat. Res.* iv. 247.

Found in the vicinity of Calcutta, but rather rare, whereas S. *spontaneum* (which Sir William Jones mistook for *Sara*) is very common every where. It is readily distinguished by being a stronger reed, the leaves much larger, with very hispid margins, the ramifications of the panicle decompound, and a corol of three valves. *Culms* perennial, erect, from six to sixteen feet high, often near the base as thick as the little finger, smooth, remarkably strong. *Leaves*, the lower ones from four to eight feet long, and narrow; the superior ones shorter, broader, tapering from the base to a most fine point, strong, and rigid; concave above, margins hispid. *Sheaths* from twelve to eighteen inches long, with a tuft of hair above their I. mouths on the inside. *Panicle* dense, when in flower open, when in seed condensed and of a 245 lanceolate shape, from one to three feet long; *branches* decompound, or more; the inferior alternate, the superior sub-verticelled with generally three sharp angles armed with small stiff bristles besides long white silky hairs. *Flowers* paired, one sessile, the other pedicelled. *Calyx* two-valved, clothed with long, soft, white, silky hairs. *Corol* three-valved, fringed.

9. S. *exaltatum. R.*

Culms from ten to sixteen feet high. *Leaves* flat with prickly margins. *Panicles* linear, crowded. *Calyces* woolly. *Corol* two and three-valved.

Kerpa. *Hort. Mal.* 12. *t.* 46. seems to be this, rather than S. *spontaneum.*

Teling. Konda-Kanamoo.

A very high beautiful species, a native of vallies. Compare with S. *Arundinaceum.*

Root creeping. *Culms* many, erect, from ten to sixteen feet high, towards the base perennial, ligneous, inwardly spongy, (not piped,) smooth, round, without any groove, or hollow any where, about an inch in circumference at the thickest part which is near the middle. *Leaves* alternate, sheathing, remote, remarkably long and narrow, but firm, tapering from the middle towards each end; margins armed with very sharp spines, mouth of the sheaths woolly. *Panicles* terminal, crowded, when the flowers are on the decay, linear, oblong, erect, eighteen inches long, three in diameter, and composed of beautiful cream-coloured, downy, short, sub-erect, ramous, sub-verticelled spiked racemes. *Rachis* round, striated. *Flowers* in pairs, one sessile, the other pedicelled, both hermaphrodite. *Calyx* one-flowered, two-valved, both valves pointed, and covered with much long, cream-coloured soft hair as well as their pedicels, and particularly round their insertion. *Corol* of the sessile flower three- I. valved, of the pedicelled flower two-valved, membranaceous, white. I could not observe any 246 *nectary. Stamens*, &c. as in the genus. *Seed* clavate, smooth, clear whitish yellow.

Obs. Cattle do not eat it.

10. S. *Munja. R.*

Straight, from eight to ten feet high, every part smooth, except the inside of the base of the hispid, long, margined, linear, white nerved, channelled leaves. *Panicles* large, oblong, spreading; *branches* thereof verticelled, and super-decompound. *Flowers* all hermaphrodite. *Corols* two-valved.

Hind. Munja See *Asiat. Res.* iv. 248.

A native of the countries about Benares where the natives make ropes of it. In the Botanic garden it blossoms in November. I never saw it, nor, so far as I can find, is it known so low down as Bengal, otherwise I might have thought it König's S. *bengalense.*

11. S. *canaliculatum. R.*

Perennial, erect, (from eight to twelve feet high.) *Leaves* subulate, deeply channelled, very long. *Panicles* linear-oblong; *ramifications* simple, and verticelled; *calycine valves* with thick callous base and fringed margins; *corol* one-valved.

A most beautiful stately species, a native of Bengal, in most thickets, &c. where the soil is rich, flowering in August and September.

Culms about as thick as a common ratan, incrusted with a white substance under the sheaths; filled with pith. *Leaves* from five to seven feet long, semi-cylindric, no where thicker than a pack thread, the whole being only a perfect channel; their sheaths simply bearded at the mouth. *Panicle* sub-cylindric, about two feet long, waving with its immense quantity

of silver-coloured, long, soft hair, to every breeze. *Flowers* paired, one sessile, the other pedicelled. *Calycine valves* are remarkable on account of their large thick smooth callous base. Page Carey Ed. I. 247

ANTHISTIRIA. Schreb. gen. N. 1567.

Polygamous. *Involucre* one-valved, seven-flowered. *Hermaphrodite flower* solitary, with a two-valved, one-flowered calyx, and corol of one valve and an awn. *Accessary florets* male or neuter, six; four sessile, resembling a calyx, and two pedicelled, their structure various.

1. A. *ciliata. Linn. sp. pl. ed. Willd.* iv. 899.

Erect. *Leaves* taper from the ciliate base. *Accessary florets* two or three-valved, neuter, exterior valve of the sessile flower papillose, ciliate near the apex.

A. *ciliata. Gært. Carp.* ii. *p.* 465. *t.* 75.

An erect annual species, a native of various parts of India, appears about the close of the rains, in October and November, and continues during the cool season.

Culms erect, about two feet high, in our rich soil of Bengal, more slender than a crow-quill, smooth, and often coloured. *Leaves* few, ensiform; broadest at the base and there more ciliate, particularly the small floral leaves. *Sheaths* much shorter than the joints, smooth, and carinated on the back. *Ligula* short and chaffy. *Panicles* sometimes drooping, though in general erect and composed of a few, rather remote, axillary branches. *Involucres* longer than the flowers, smooth, cuspidate.

Hermaphrodite Flowers bearded at the base. *Calyx* two-valved; valves hard, obtuse, and somewhat hairy, by age changing from straw colour to dark brown. *Corol* one small, pellucid valve, and a very strong, long, thick, brown, hairy awn on the opposite side. *Stigma* three. *Styles* two, with ochraceous plumose stigmas, which become brown by age. *Nectarial* scales large, with crenate, truncate apices.

Accessary Florets six, all neuter. *Calyces* two-valved, those of the sessile four, papillose, ciliate near the apex; those of the upper pedicelled two, smaller and smooth. *Corols* none, or of one, small, hyaline valve. *Stamina* none. I.

2. A. *polystachya. R.* 248

Culms numerous, sub-erect. *Leaves* taper from their sub-ciliate base. *Accessary florets* three-valved, male, exterior valves of the sessile four, papillose, ciliate near the apex.

A native of Bengal, and with the other species which are natives of the same country, appears at the close of the rains, in October and November.

Culms many, annual, erect, or ascending, smooth, from one to two feet high. *Leaves* about the length of the joints of the culm, taper from the base, and there sometimes sub-ciliate. *Panicles* slender, erect, or nearly so, composed of a few alternate, axillary branches. *Involucres* longer than the flowers, smooth, sub-aristate.

Hermaphrodite Flowers bearded at the base. *Calyx* two-valved, both hard, a little hairy awn on the opposite side. *Corol* one-valved, with a long, strong, hairy awn on the opposite side.

Accessary Florets six, all male. *Calyces* two-valved, the exterior one of the four sessile florets papillose, ciliate near the apex. *Corol* of one transparent valve. *Stamens* three. *Pistil* none.

3. A. *scandens. R.*

Perennial, ramous, scandent, geniculate, emitting roots from the joints. *Floral leaves* with the base ciliate. *Panicles* copious, shaggy. *Involucres* smooth. *Accessary florets* two-valved, neuter; exterior valve of the sessile four, papillose, ciliate near the apex.

A native of Bengal; flowers during the cool season.

Root perennial. *Culms* scandent, running to an extent of many feet, smooth, ramous, jointed, and coloured; from the joints numerous roots issue, and enter the ground if not too far removed from it. *Leaves* ensiform, the floral ones much shorter, and ciliate at the base. *Panicle* terminal, composed of erect ramifications of numerous, rather remote fascicles of axillary, short-pedicelled umbellets, each of which is furnished with a boat-shaped spathe or bracte, and consists of four, sessile, neuter, two-valved florets in a verticil; above these are two more, but much smaller, on short pedicels, with one sessile, awned, hermaphrodite one in the centre, on a short scaly receptacle. *Calyx* two-valved, the exterior valves of the lower four neuter florets bearded, of the hermaphrodite ones boat-shaped, and very obtuse. *Corol* of the hermaphrodite flower two-valved, with a long, ferruginous, straight arista. I. 249

Obs. It differs from A. *ciliata* in being an extensively scandent, perennial plant.

4. *A. heteroclita. R.*

Culms leaning, geniculate. *Leaves* ciliate. *Involucres* five-flowered, two awned hermaphrodite ones, and three ciliate male ones.

This is one of the smallest of the genus, a native of newly made pasture land in the vicinity of Calcutta, where it appears about the close of the rains, and during the cool season.

Culms annual, erect, or leaning, geniculate, smooth, and coloured; from twelve to twenty-four inches high. *Leaves* ensiform, soft and hairy. *Sheaths* much shorter than the joints. *Panicles* copious, hirsute, composed of numerous small umbels and these in general of five or more umbellets, the former with a common cymbiform, bristly involucre, and the latter with a small, proper characteristic involucre, equally bristly; all the bristles have a round bulbous base. *Umbellets* five-flowered; the two hermaphrodite ones awned, and the three male ones pedicelled, and awnless; one of the former is sessile below, with a pedicelled male one by it:

Page Carey Ed. the other elevated on a common pedunele, embraced by the other two male ones on their proper pedicels, in all of them the calyx is two-valved, no corol, the arista in the hermaphrodite flowers excepted.

I. 250 *Obs.* This species may be immediately distinguished by its umbellets being composed of two hermaphrodite awned florets, and three male ones. In all the rest, which I have met with there is one awned hermaphrodite, and six male, or neuter florets in the umbellet.

5. A. *prostrata. Linn. sp. pl. ed. Willd.* iv. 901.

Creeping. *Leaves* scarcely longer than their sheaths. *Involucres* smooth. *Accessary florets* male, with a two-valved hairy calyx and one-valved awnless corol.

A common grass, delighting in rich pasture ground.

Culms creeping, or leaning on other plants, filiform, ramous, wiuding from joint to joint, round, smooth, from one to three feet long. *Leaves* below, and on leafy sheats bifarious, small, particularly the floral ones, smooth. *Sheaths* short, compressed. *Panicles* thin, leafy. *Flowers* numerous, collected in little pedicelled, involucred fascicles from the axills of the exterior leaves. *Fascicles*, or *umbellets*, their pedunele are jointed near the apex, and from thence upwards embraced by a long, boat-shaped sheath or involucre. Flowers of the umbellet seven; one hermaphrodite or female, and six male: four of the male florets on their proper short pedicels surround a common pedicel which elevates the hermaphrodite or female one, and the other two male florets; these last two have also their proper pedicels; all their insertions are surrounded with hair.

Hermaphrodite two, or Female three Flowers. *Calyx* two-valved, pointed. *Corol* one-valved, a pretty long twisted awn occupying the place of the other. *Stamens* three, or none. *Male flowers*, four at the base, and two embracing laterally the hermaphrodite, or female flowers, each of these two has its proper pedicel. *Calyx* two-valved, lanceolate, hairy. *Corol* one-valved. *Stamens* three.

Obs. It often happens that there are two hermaphrodite, and seven male flowers in the I. 251 fascicle: in that case one of the usual lateral pedicels supports the additional two flowers.

6. A. *cymbaria.* R.

Erect, ramous. *Leaves* many times longer than their sheaths. *Involucres* smooth. *Accessary florets* male, with a two-valved, ciliate calyx, and a one-valved, awnless corol.

Andropogon cymbarius. *Linn. mant.* 303. *sp. pl. ed. Willd.* iv. 909.

Teling. Pedda Ghella.

This is a large species. I have generally found it amongst bushes on mountains.

Culms many, erect, from three to six feet high, very ramous, smooth, solid. Rigmons, joints smooth. *Leaves* large in proportion to the size of the plant. *Panicles* linear, leafy, erect, composed of innumerable bracted fascicles like those of the last described. *Bracts* boat-shaped, ending in a very long, subulate point, sometimes coloured, and in luxuriant plants fringed with many long rigid hairs. *Flowers* seven in each fascicle or umbellet as in the last, and disposed exactly in the same manner, only here the four male flowers that surround the base of the common pedicel are sessile.

Hermaphrodite Flowers. *Calyx* two-valved. *Valvules* nearly equal, linear, smooth, of a firm texture. *Corol* one-valved, the place of the second is occupied by a long twisted awn. *Stamens* three, &c. as in the genus.

Male Flowers. *Calyx* two-valved, the exterior valve fringed with many strong hairs about the apex. *Corol* one-valved. *Stamens* three.

7. A. *arundinacea.* R.

Perennial, straight, from six to twelve feet high: *leaves* from four to eight feet long; *accessary florets* male, with both *calyces* and *corols* two-valved; the exterior valvelet of the former shaggy.

I. A native of Bengal. Flowering time the beginning of the cool season.

252 *Root* perennial. *Culms* straight, jointed, glaucous, between the joints much contracted, round and very smooth, the lower joints of the large plant as thick as the fore finger; every part filled with white spongy pith; height of the whole plant when in flower, from six to sixteen feet. In the Botanic garden where the soil is rich some plants are full sixteen feet high. *Leaves* from six to eight feet long, slender, deeply channelled toward the base, recurvate, margins hispid. The radical ones are bifarious, the floral ones alternate, sheaths smooth, compressed, much shorter than the joints of the culm. *Panicle*, the whole upper half of each culm may be so called, and is composed of numerous, axillary, very ramous branches, bending elegantly to one side, particularly with a breeze of wind. *Bracts* one to each umbellet of flowers, boat-shaped. *Umbellets* numerous, long, slender, pedicelled, drooping, each one is composed of four, sessile, awnless accessary male flowers surrounding, and inserted on a short clavate pedicel, which supports an hermaphrodite awned flower, and two pedicelled awnless ones.

Male Flowers. *Calyx*, *glume*, two-valved, the exterior valve clothed with much diverging fulvous hair, making it quite shaggy. *Corol*, *glume*, two-valved, linear, membranaceous. *Nectary* of two cuneate, truncated scales. *Stamens* three. *Pistil* none.

Hermaphrodite Flowers. *Calyx* two-valved, villous. *Corol* one-valved, a long arista occupies the place of the usual second valve. *Nectary* and *stamens* as in the male. *Germ* oblong; *styles* two, villous,

ANDROPOGON. Schreb. gen. N. 1566.

Polygamous. *Flowers* in pairs, hermaphrodite, sessile. *Calyx* two-valved, one-flowered. *Co-*

rol for the most part two-valved, and generally awned. *Male*, or *neuter* pedicelled. *Calyx* as in the hermaphrodite. *Corol* for the most part two-valved, generally awnless. Page Carey Ed. I. 253

SECT. I. *With terminal Spikes.*

1. A. *serratus. Retz. Obs.* v. 21. *Linn. sp. pl. ed. Willd.* iv. 903.

Spikes solitary, or paired, imbricated with sessile, hermaphrodite, awned flowers on the outside, and two rows of awnless pedicelled male ones on the inside.

Sans. Vence, Khura, Guree, Ugurec, Khuragurec, Guragurec, Devutara, Jeenoota.

Beng. Detara, or Detta.

A native of pasture ground. Flowers during the cold season.

Culms at and near the base creeping, branchy, with only about a foot of their flower-bearing extremities erect, and as thick as a sparrow's quill, round, smooth, joints slightly villous. *Leaves* small, inside a little hairy, mouth of the sheaths hairy. *Spike* terminal, generally solitary, though sometimes there are two or even three; when single, long-peduncled, when two, each has a very short, erect pedicel; the spike or spikes are about an inch and a half long. *Flowers* in pairs, numerous, imbricated, on one side are two rows of sessile, hermaphrodite ones, and in the other two rows of pedicelled ones; *male rachis* waved, jointed and hairy. *Hermaphrodite flowers* sessile. *Calyces* two-valved, the exterior one broad, compressed, striated, a little hairy, rounded at the apex; *margins* fringed with hairs; *involucre* smooth, glossy, keeled, pointed. *Corol* of the hermaphrodite flower one-valved; the arista which is pretty long and twisted, occupies the place of a second; that of the male two-valved, the inner one slender and bifid.

Obs. Cattle will eat it, but not greedily.

2. A. *contortus. Linn. sp. pl. ed. Willd.* iv. 904

Monoicous. *Spikes* solitary; *inferior flowers* male or neuter and awnless; *superior flowers* one female and awned, the other male and awnless. I. 254

Teling. Yeddi.

Grows in tufts on rich pasture ground.

Culms near the base spreading a little, there compressed and ramous, the rest from one to two feet high, erect, round, and smooth; joints smooth. *Leaves* below bifarious, middle-sized, upper side scattered with a few hairs, margins and mouths of the sheaths hairy. *Spikes* always single, terminal, bowing, cylindric; *rachis* jointed, waved, round, below where it is occupied by the male and neuter flowers smooth; above where the female flowers are, it is covered with much short, brown hair. *Flowers* numerous, imbricated in pairs; on the lower half of the spike they are all neuter, or male, and awnless, one sessile, one pedicelled; on the upper half the sessile flower is female, and the pedicelled one male.

MALE or neuter FLOWERS. *Calyx* two-valved, one-flowered; exterior valvelet green, and covered with stiff white hair; inner valve membranaceous, and smooth, except the margins, which are slightly ciliate. *Corol* two-valved, membranaceous, margins slightly ciliate. *Stamens* three or none.

FEMALE FLOWERS. *Calyx* one-valved, one-flowered, rigid, embracing the corol on all sides, brown, a little hairy. *Corol* one-valved, small, the place of the other is supplied by a very long, twisted arista.

3. A. *tenellus. R.*

Filiform, *spikes* paired. *Flowers* paired, the sessile ones hermaphrodite, and awned; the pedicelled ones neuter, and awnless; exterior valves of both calyces oblong, striate, hairy, and three-toothed; neuter corol of one minute valve.

A most delicate tail grass, a native of Bengal, where it appears in hedges, &c. during the cool season.

Culms from two to three feet long; at the base resting on the ground, ramous, scarcely so thick as a pack thread; *joints* villous. *Leaves* slender, a few hairs toward the base. *Spikes* paired, erect, short-pedicelled; *outside* imbricated with two rows of sessile, awned, hermaphrodite flowers; *inside* with rows of pedicelled, awnless, neuter ones. *Rachis* jointed and hairy. *Calyces* two-valved; *exterior* oblong, three-toothed, striated, hairy; *interior* acute, three-nerved, that of the neuter flower shorter. *Corol* of the hermaphrodite flower one-valved, with a long brown awn on the opposite, or inner side, that of the neuter flower single, and very minute. I. 255

4. A. *binatus. Linn. sp. pl. ed. Willd.* iv. 918. *Retz. Obs.* v. 24.

Slender, towards the base creeping; *spikes* paired, incurved; *flowers* paired; the sessile ones hermaphrodite, and awned; the pedicelled ones male, with an awnless, two-valved corol.

A native of Bengal, appears during the cool season.

Culms very slender, toward the base ramous, and creeping; *joints* with a scanty short beard. *Leaves* slender, somewhat hairy toward the base. *Spikes* paired, on a long filiform pedunele, short-pedicelled, somewhat incurvate; *outside* imbricated with two rows of sessile, awned, hermaphrodite flowers; *inside* with two very distinct (for they are separated by a deep groove) rows of pedicelled, awnless, male ones. *Rachis* jointed, and hairy. *Calyces* of both two-valved; *exterior* oblong, hairy, ciliate, five to seven-nerved, edges thin, apex of the male tridentate, of the hermaphrodite obtuse. *Inner valves* acute, three-nerved. *Corol* of the hermaphrodite flower of one hyaline valve on the outside and an arista for the other; of the male one of two very small hyaline valves. *Styles* two; *stigma* purple, villous. *Seed* oblong, smooth.

5. A. *conjugatus. R.*

Page Carey Ed. Straight, very ramous, filiform. *Spikes* conjugate, both flowers hermaphrodite, and both awned; *exterior* valves of the calyces lanceolar, and copiously ciliate.

A native of Bengal, and the smallest of the genus I have yet met with. Flowers during
I. the cool season.
256 *Root* a few very slender, brown fibres. *Culms* in tufts, and very ramous, filiform, erect, smooth, even the joints; from six to twelve inches high. *Leaves* minute, a few hairs near the base. *Spikes* always exactly paired as in most species of *Ischœmun*, erect, flat on the inside, where they touch each other. *Rachis* winding, and clothed with long, silver-coloured hairs, length about an inch. *Flowers* in pairs, one sessile, one pedicelled, both hermaphrodite, and both awned. *Calyces* two-valved, one-flowered; *exterior* valve in both lanceolate, with the margins copiously ciliate. *Corol* two-valved; *valves* transparent, and brown; that (the inner) which gives support to the arista, bifid. *Stamens* three. *Styles* two. *Stigmas* long and plumose.

6. A. *filiformis. R.*

Filiform, annual, erect. *Spikes* paired. *Flowers* all sessile, solitary; hermaphrodite, diandrous, with a corol of one valve, which ends in a long awn.

This is the most delicate species I have yet met with; appears in small tufts, on pasture land near Calcutta, in the months of October, November, and December.

Culms numerous, filiform, smooth, erect, from nine to twelve inches high. *Leaves* small, slender, and smooth. *Spikes* two, terminal, filiform, scarcely two inches long. *Flowers* all hermaphrodite, solitary, sessile, no pedicelled flower being found, no pubescence about the calyx, or rachis. *Calyx* two-valved, one-flowered. *Corol* of one large, awned valve. *Stamina* two, one of the anthers larger. *Germ* ovate. *Styles* two.

7. A. *tristachyos. R.*

Spikes three, both flowers hermaphrodite, and both awned. *Calyces* lanceolate, and ciliate.

A delicate, beautiful species found on newly laid down pasture ground in the vicinity of
I. Calcutta, and in flower in October, November, and December.
257 Annual, with numerous, nearly straight, erect, smooth, slender, pithy culms, of from one to two feet in height. *Leaves* taper from the base, most acute, about as long as the joints of the culms; a few long soft hairs on the inside near the base. *Sheaths* smooth, shorter than the joints. *Spikes* two, rarely three, and I have not seen four, one sessile the other two a little more elevated on a common pedicel, expanding; from two to three inches long. *Rachis* jointed, winding, and hairy. *Flowers* in pairs, one sessile, the other pedicelled, both hermaphrodite, and both awned. *Calyces* two-valved; *valvelets* lanceolate, ciliate; backs smooth, and brown. *Corol* of two, small, pellucid, brownish valves, the inner of each, ends in a long, brown, arista, proceeding from the bifid apex of the valvelet.

8. A. *tridentatus. R.*

Spikes paired, hirsute, both flowers hermaphrodite, and awned. *Calyces* shaggy, exterior valves cuneate, truncate, tridentate. *Corols* four-valved.

A delicate, rather tall species; a native of Coromandel.

Culms straight. *Leaves* small. *Spikes* terminal, paired, sessile, lanceolate, shaggy. *Flowers* in pairs; one sessile, the other short-pedicelled, both hermaphrodite, and both awned. *Calyx*, exterior valves in both flowers cuneiform, with apices truncate, tridentate, back striated; middle part, as well as the margins from thence down, and the base bearded with fulvous hairs; inner valve longer than the exterior, ending in a pretty long arista; margins amply fringed with long fulvous hairs. *Corol* in both flowers four-valved; the exterior one on the inside bifid, and awned.

9. A. *lanceolatus. R.*

Leaves lanceolate, with cordate stem-clasping base, bristle-ciliate. *Spikes* tern, peduncled. *Sessile* or *hermaphrodite flower* awned, with the margin of the exterior valve of the calyx
I. acutely pectinate, serrate.
258 A native of Coromandel, and very much like *Panicum setigerum*.

Culms scandent, or creeping, emitting roots from the joints, seems perennial. *Leaves* lanceolate, base cordate, and stem-clasping, apex acute, smooth on both sides, but the edges, from the middle down, bristle-ciliate. *Spikes* terminal, two, three, or four, peduncled. *Rachis* and *pedicel* of the male flower somewhat woolly. *Calyces* lanceolate; *exterior valve*, and chiefly that of the hermaphrodite sessile flower with the margins minutely and acutely pectinate-serrate. *Corol* in both two-valved, with an arista in the hermaphrodite one.

10. A. *scandens. R.*

Climbing; *spikes* from three to six, digitate; *calyx* lanceolate; *male corols* one-valved, and awnless; *hermaphrodite* ones with a one-valved corol and an awn.

Grows commonly in hedges, and on that account scandent; appears and flowers during the rains.

Culms long, ramous, creeping, or climbing over bushes, &c. emitting long roots from the joints; smooth and deeply grooved on one side; flower-bearing extremities erect, and about one or two feet long; *joints* woolly. *Leaves* sometimes a little hairy on the upper side, mouths of the sheaths membrane-stipuled, and hairy. *Spikes* generally from three to six, terminal, short pedicelled, sub-panicled flowers in approximate pairs; one hermaphrodite, and sessile, the other male, and pedicelled. In both the calyx is of two lanceolate, somewhat hairy valves. In the hermaphrodite one the corol is of one valve, and the place of the second valve is occupied by a long twisted arista. In the male one it is two-valved.

Obs. It is a coarse grass. Cattle are not fond of it.

Page Carey Ed.

11. A. *pertusus. Linn. sp. pl. ed. Willd.* iv. 922.

Near the root creeping. *Spikes* from four to eight, digitate, pedicelled, exterior valve of the sessile, awned, hermaphrodite calyx with a pit on the back; male or neuter corol one-valved. I. 259

Holcus pertusus. *Kön. Linn. Mant.* 301.

Is found on old pasture ground, which is generally shaded by trees.

Culms creeping near the base, &c. as in the last two species; joints bearded. *Leaves* small, ciliate; *mouths* of the sheaths bearded. *Spikes* from four to eight, in other respects exactly as in the last species. *Flowers*, the specific mark is to be found in the pit of the exterior valves of the calyx of the hermaphrodite flowers, as in A. *strictus*, and A. *punctatus*, to be described; an arista occupies the place of the second valve of the corol; the valvelets of the calyx are both awnless.

Obs. I should doubt this being König's *Holcus pertusus*, if he had not pointed it out to me himself.

12. A. *Bladhii. Linn. sp. pl. ed. Willd.* iv. 920.

Sub-scandent; joints pubescent. *Spikes* from three to six, sub-panicled. *Calyces* lanceolate; *male corols* two-valved; *hermaphrodite* ones one-valved with an arista; *flowers* paired.

Beng. Loari.

A native of hedges and road sides, but chiefly of old pasture ground.

Culms as in the last described species; joints much bearded. *Leaves* the same. *Spikes* from four to eight, short-pedicelled, inserted round the last half in each of the culms; in other respects they are as in the last described species. The flowers resemble those of that species, but are a little more remote. *Calyx* and *Corol* the same as in A. *scandens*.

13. A. *Ischœmum. Linn. sp. pl. ed. Willd.* iv. 921.

Spikes from six to eight, fascicled, peduncled; *rachis* hairy. *Flowers* lanceolate; *hermaphrodite*, sessile, and awned; *male* pedicelled and awnless; *calyces* acute; *exterior valve* hairy. I. 260

A native of Coromandel, a stout, erect species, with a branch from the axill of each of the superior smooth short leaves, having much the appearance and habit of *Bladhii* and *pertusus*; from the former it differs most conspicuously in the valves of the calyces being acute, whereas in *Bladhii* they are broad and rounded; and from *pertusus* in the want of the pit on the back of the exterior valve of the hermaphrodite flower.

SECT. II. *With long peduncled, axillary Spikes.*

14. A. *monandrus. R.*

Erect, filiform, with erect, filiform, branches at the top. *Spikes* solitary, flowers hermaphrodite, and female; *exterior valvelet* of the calyces and corols of both awned; *hermaphrodite* monandrous.

A native of mountainous countries.

Culms many, ramous, filiform, straight; about a foot high, round and smooth. *Leaves* small, base and mouths of the sheaths hairy. *Spikes* generally solitary, terminal, and from the exterior axills, long-peduncled, straight, about an inch long. *Peduncles* filiform, jointed, and spathed at the middle. *Rachis* jointed, winding, hairy. *Flowers* numerous, imbricated in pairs; one, the hermaphrodite, sessile, and the other, female, pedicelled.

Hermaphrodite Flowers sessile. *Calyx* two-valved, nearly equal, exterior valvelet ending in a long slender arista, the inner one with its apex obtuse, and bearded. *Corol*, exterior valve ending in a long slender awn. *Stamen* one. *Styles* two, &c. as in the genus.

Female Flowers pedicelled. *Calyx* and *corol* as in the hermaphrodite ones; only the inner valve of the calyx is pointed, and bearded.

15. A. *strictus. R.* I. 261

Straight, ramous at the top; base of the leaves ciliate. *Spikes* fascicled on their own proper pedicels; exterior valvelets of both calyces pitted; inner glume of the hermaphrodite corol awned.

A native of mountains, and their vicinity.

Culms straight, ramous, about two feet high, and as thick as a sparrow's quill, round and smooth; joints bearded. *Leaves* slender, a little hairy, and ciliate near the base; mouths of the sheaths stipuled. *Spikes* from three to six, long-pedicelled, and collected on a common peduncle, one of which is terminal, and one or two more from the next one or two exterior axills; very slender, perfectly erect, and about an inch long. *Rachis* as in the former species. *Pedicels* most fine, straight, two inches long, jointed near the base, where a fine slender spathe begins. *Flowers* in pairs; one hermaphrodite and sessile, the other small and pedicelled.

Hermaphrodite Flowers sessile. *Calyx* as in the genus, except that the exterior large valvelet has a large pit in it, as in A. *pertusus*. *Corol*, inner valve slender, ending in a long twisted awn.

Male Flower pedicelled. *Calyx* one-valved, and pitted as in the hermaphrodite flower. *Corol* two-valved, awnless.

16. A. *polystachyos. R.*

Straight; *spikes* numerous, axillary, simple, each elevated on a long jointed, sheathed peduncle. *Flowers*, inferior pairs male and awnless; one of the superior ones is female and simply awned, the other male and awnless.

A native of the Peninsula of India. The flowers greatly resemble those of A. *contortus*,

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but the habit of the grasses is very different.

Culms straight, ramous. *Leaves* ensiform, straight, acute, ciliate at the base. *Spikes* simple, many together on the axill of the leaves, each elevated high on its long, filiform, jointed, sheathed peduncle, length from one to two inches. *Flowers* paired, those on the lower two-thirds of the spike are all male, and awnless, and, as usual, one of them sessile, the other short-pedicelled; *superior pairs*, the sessile one of each of these is a slender female, amply bearded at the base with much dark brown hair, which is the more conspicuous as every other part of the spike is smooth; the other short-pedicelled, male, and awnless, like the inferior pairs.

Male Flowers. *Calyx* two-valved. *Corol* two-valved. *Stamina* three.

Female Flowers. *Calyx* of one linear, striated, hard, dark brown valve. *Corol* one-valved, with a very long, twisted awn on the other side. *Stamina* none. *Styles* two.

SECT. III. *Panicles naked, and terminal.*

17. A. *aciculatus. Linn. sp. pl. ed. Willd.* iv. 906.

Creeping. *Leaves* shorter than their sheaths. *Panicle* linear-oblong, erect; *ramifications* three-flowered, one hermaphrodite, sessile, and two male, peduncled.

Gramen aciculatum. *Rumph. Amb.* 6. *t.* 5. *f.* 1. good.

Raphis trivalvis. Lour. *Cochin. Ch.* 676.

Kudira-pullu. *Rheed. Mal.* 12. *p.* 97. *t.* 43.

Sans. Shunkhinee, Chora-pooshpee, Keshinee.

Beng. Chora-kanta.

Grows on barren, moist, pasture ground; its seeds are exceedingly troublesome to those who walk where it grows, as they stick in the stockings, and produce a disagreeable itching.

Culms straight, simple, from one to two feet high, round and smooth. *Leaves* small, waved, with the margins prickle-ciliate. *Panicle* terminal, erect, linear-oblong, from two to three inches long. *Ramifications* (or rather peduncles) verticelled, simple, three-flowered, nearly erect; apex armed with short stiff hairs. *Flowers*, one sessile, hermaphrodite, and two pedicelled male ones on each peduncle.

Hermaphrodite Flower. *Calyx* two-valved, nearly equal; the inner one ends in a short arista, and has the keel scabrous; base involved in brown short hair. *Corol* two-valved, the inner one ending in a short rigid arista. *Stamens* three, &c. as in the genus.

Male Flowers. *Calyx* and *corol* as in the male, except that there is no *arista* to the corol.

Obs. It is of a very coarse nature. I never found it touched by cattle.

18. A. *verticillatus. R.*

Erect. *Leaves* long, and very hairy; *panicle* conical; *ramifications* verticelled, three-flowered; one hermaphrodite, sessile, with two awns; and two-pedicelled, male, with one awn each.

A native of mountains, flowering about the end of the wet season.

Root woody, perennial. *Culms* erect, simple, very leafy, smooth, round, towards the base soiled, as thick as a small goose-quill; from four to six feet high. *Leaves* approximated, eighteen inches long, and three quarters of an inch broad; margins set with minute spines, and particularly hairy on the inside near the base. *Panicles* erect, conical, lax, from eight to ten inches long, composed of many verticelled, most simple filiform, waved, bowing, three-flowered branches, as in A. *aciculatus.*

Hermaphrodite Flowers sessile. *Calyx*, glume one-flowered, two-valved, inner valve awned, both hairy, having the base surrounded with much brown hair. *Corol* one-valved, a long twisted awn occupying the place of the other. *Stamens* three. *Style* yellow.

Male Flowers pedicelled, one on each side the hermaphrodite one; pedicels covered with brown hairs. *Calyx*, exterior valve a little hairy, and awned, base involved in short brown hair. *Corol* two-valved. *Stamens* three.

I. 264 19. A. *saccharoides. Linn. sp. pl. ed. Willd.* iv. 912.

Sub-erect. *Leaves* remarkably long. *Panicle* oblong, composed of simple, alternate, filiform, short-pedicelled, erect, patent branches; neuter florets two-valved and pedicelled.

A large, leafy, sub-erect species; a native of the mountainous parts of the Northern Circars.

I am not possessed of any other description of Swartz's A. *saccharoides* than the specific character, as it stands in Willdenow's edition of the species, which agrees with my plant; I therefore conclude they are the same.

20. *Ischæmum. Linn. sp. pl. ed. Willd.* iv. 921.

Spikes from six to eight, fascicled, peduncled; *rachis* hairy. *Flowers* lanceolate, hermaphrodite, sessile and awned; *male* pedicelled and awnless; *calyces* acute, exterior valve hairy.

A native of Coromandel. It is a stout erect species, with a branch from the axill of each of the superior smooth short leaves; it has much the appearance and habit of *Bladhii*, and *pertusus*; from the former it differs most conspicuously in the valves of the calyces being acute, whereas in *Bladhii* they are broad and rounded; and from *pertusus* in the want of the pit on the back of the exterior valve of the hermaphrodite flowers.

21. A. *punctatus. R.*

Erect, simple. *Leaves* large, long, and numerous. *Panicle* of numerous, simple, second ramifications. *Exterior* valves of the calyces of both hermaphrodite and neuter flowers pitted.

This is a mountain grass. Page Carey Ed.

Culms from two to four feet high, without branches, below bent towards the earth for half a foot, often erect, entirely surrounded with the sheaths of the leaves; not piped, but replete with spongy pith. *Leaves* numerous, large, with some long white hairs scattered over them near the base; mouths of the sheaths stipuled, bearded, and woolly. *Panicle* erect, oblong, from four to five inches high, composed of many, erect, short-peduncled, filiform, secund, I. spiked racemes; *rachis* and flowers exactly as in A. *fascicularis;* except that here the outer 265 valve of the calyx of both flowers has a pit in the middle. The *corol* of the hermaphrodite flower wants the inner valve; in its place is a pretty long twisted awn.

22. A. *fascicularis. R.*

Erect, ramous. *Panicle* composed of fascicled, simple, or divided branches. *Flowers* paired; hermaphrodite ones awned; neuter ones awnless and without a corol.

Teling. Kunda-jeri.

A native of mountains.

Culms erect, jointed, smooth, rather thicker than a crow's quill, from three to five feet high, sulcated, mostly naked, rush-like, not piped. *Leaves* from three to four, small, remote, retrorso-scabrous; mouths of the sheath hairy; from each sheath springs a short panicle-bearing branch. *Panicle* terminal, six inches long, erect, fascicled; *fascicles* remote, alternate, composed of several erect, filiform, often ramous, secund spikes, or spiked-racemes. *Flowers* in pairs; the hermaphrodite ones sessile; the neuter peduncled. *Common rachis* round, smooth; *partial one* undulated, jointed, compressed, woolly.

Hermaphrodite Flower. *Calyx*, glume one-flowered, two-valved, smooth, awnless, base surrounded with wool. *Corol, exterior valve* the length of the calyx; *inner* short, bifid, with a long twisted awn from the fissure. *Neuter floret* small, its pedicel woolly, length of the hermaphrodite flower. *Calyx* two-valved. *Corol* none.

23. A. *muricatus. Retz. Obs.* iii. *N.* 95. and v. 20.

Erect in all situations. *Leaves* sub-bifarious, long, narrow, and rigid. *Panicle* verticelled; *ramifications* simple, expanding, hermaphrodite and male flowers awnless, with muricate calyces, and corols of three valves.

Sans. Veerunung Veeruturung.

Beng. Bena, the name of the plant, and *Khuskhus* the root. I.

Tam. Woetiwear. 266

Virana. *Asiat. Res. vol.* iv. *p.* 306.

It is very common in every part of the coast and Bengal, where it meets with a low, moist, rich soil, especially on the banks of water courses, &c.

Root of many perennial, long, spongy, brown fibres. *Culms* many, smooth, simple, rigidly erect, a little compressed at the base, jointed, smooth, inwardly spongy; from four to six feet high and as thick as a goose-quill. *Leaves* near the base bifarious, narrow, erect, from two to three feet long, pretty smooth, rigid. *Panicle* from six to twelve inches long, conical, composed of numerous spreading, short-peduncled, simple, linear, verticelled *spiked-racemes. Rachis* of the spiked-racemes jointed, winding, naked. *Flowers* paired, awnless; one hermaphrodite, sessile; the other male, and pedicelled; insertions nearly naked.

Hermaphrodite Flower. *Calyx* two-valved, nearly equal, muricated. *Corol* three-valved, membranaceous. *Nectary,* two obcordate scales embracing the germ and insertions of the filaments. *Stamens* three. *Stigmas* feathery.

Male Flower. *Calyx* as in the hermaphrodite. *Corol* two-valved. *Nectary* as above. *Stamens* three.

Obs. The roots, when dry, and then gently moistened, emit a pleasant kind of fragrance; they are employed to make large fans, commonly called *Vissaries,* and also screens which are placed before windows and doors, which being kept moist during the hot winds render the air that passes through them, both cool and fragrant. See Observation on *Aristida setacea.* The grass is often employed for thatch.

Dr. König was too accurate a Botanist to describe this very conspicuous plant under two names, viz. A. *squarrosus. Linn. sp. pl. Willd.* iv. 908, and A. *muricatus;* the former is evidently a very different species, and found by him in Ceylon, floating on pools of water; whereas A. *muricatus* (which I formerly called *aromaticus*) is always rigidly erect, whether I. growing in water, or on dry land. Its root is delightfully aromatic, as mentioned by König 267 himself, and by Sir William Jones, particularly when moistened with water.

I am inclined to think König's A. *squarrosus* is my *Panicum paludosum;* a species with thick spongy culms, which is generally found swimming on pools of sweet water.

24. A. *glaber. R.*

Erect, ramous, smooth. *Panicle* ovate, verticelled; *ramification* simple, two or three-cleft. *Flowers* paired, the hermaphrodite ones awned, with the calyx pitted; the male ones neither pitted nor awned, with a two-valved corol.

Beng. Gundha-goorana.

Found thinly scattered on rather elevated spots over Bengal.

Root perennial. *Culms* sub-erect, very ramous, smooth, from three to four feet high. *Leaves* glossy, smooth in every part. *Panicles* ovate, verticelled; *ramifications* simple, and two-cleft, or even three-cleft sometimes. *Flowers* paired; the *hermaphrodite* ones sessile and awned; the *male* ones pedicelled, and awnless.

Hermaphrodite Flowers. *Calyx* two-valved, smooth, purple-coloured; exterior valve pitted on the back. *Corol* one-valved, a long awn occupying the place of the second.

Male Flowers nearly as large as the female. *Calyx* not pitted. *Corol* two-valved.

Page Carey Ed.

25. A. *montanus. R.*

Shrubby near the base, creeping. *Leaves* long and slender. *Panicle* sub-verticelled; *ramifications* ramous; *flowers* paired; the hermaphrodite ones awned; the neuter awnless, with a corol of one valved.

Teling. Auroots hangali.

A native of mountainous countries.

I. 268 *Culms* many, below resting on the ground and rooting, round, smooth, from three to four feet high, and as thick as a large crow's quill. *Leaves* long and narrow, a little hairy on the upper side near the base only; mouths of the sheaths bearded. *Panicle* terminal, conical, from four to eight inches long, composed of many, ramous, sub-verticelled spikes, or rather spiked-racemes; *rachis* winding, jointed, a little hairy. *Flowers* as usual, in pairs, an hermaphrodite one sessile; and a neuter one pedicelled.

HERMAPHRODITE FLOWERS. *Calyx* two-valved, the exterior one a little hairy. *Corol* one-valved, a twisted awn two or three times the length of the corol supplies the place of the other. *Neuter* flowers like the hermaphrodite ones, but without arista.

26. A. *bicolor. R.*

Erect. *Panicle* diffuse, with expanding, decompound and super-decompound branches; *hermaphrodite* calyces with smooth backs, and fringed margins; *corol* three-valved, and awned; calyx of the *neuter flower* hairy, with a two-valved corol.

Holcus bicolor. *Linn. sp. pl. ed. Willd.* iv. 929.

Beng. Kala-deodhan.

Hind. Kala-jooar.

Teling. Muka-janoo, and Muka-janoolar the grain.

I have only found it in a cultivated state.

Culms generally single, straight, round, smooth, from four to ten feet high, and as thick as the finger or thumb, mostly covered by the sheath of the leaves. *Leaves* from one to three feet long, and from one to three inches broad, smooth; *mouths* of the sheaths bearded. *Panicle* erect, oval, dense, composed of many ramous, expanding, sub-verticelled branches, the various ramifications angular and very hispid when the finger is drawn backwards over them, their flower-bearing extremities hairy. *Flowers* paired, and, as in the genus, the sessile one is hermaphrodite and the pedicelled one neuter.

I. 269 HERMAPHRODITE FLOWERS sessile. *Calyx; valvelets* nearly equal, with the back smooth, and as they ripen becoming of a shining black, with many white hairs round the margins (ciliated.) *Corol* three-valved, fringed, the second or solitary valve ending in a short twisted arista. *Seeds* oval, brown, smooth, free, with an impression on the back near the base.

NEUTER FLOWERS pedicelled. *Calyx* striated, hairy. *Corol* two-valved, awnless. *Stamens* none.

Obs. This and the following species A. *Sorghum* seem to me to possess more of the character of *Andropogon* than of *Holcus*. I have therefore changed their places from the latter to the former.

27. A. *Sorghum. R.*

Erect. *Panicle* contracted, dense; hermaphrodite calyces hairy. *Corols* three-valved, awned.

Holcus Sorghum. *Linn. sp. pl. ed. Willd.* iv. 929.

Beng. and *Hind.* Jooar.

Teling. Tella, or Kouda (white) janoo the name of the plant, and Tella-janoolar the grain.

Obs. This also I have only found in a cultivated state. It differs from the former.

1*st.* In having the panicle contracted, very dense, and less regularly verticelled.

2*d.* In having the glumes of the calyx of a whitish green colour and very woolly.

3*d.* In having three valves to the neuter flowers.

There are two other sorts, which I take to be only varieties of the last; their names in Telinga are *Pacha* (green) *Janoo* and *Yerra* (red) *Janoo*.

These last two with their varieties are much cultivated on a rather elevated, good soil. Seed time October; and harvest time, January. The produce in good soil is often upwards of an hundred-fold. The grain is much used for food. It is probable that through the whole of Southern Asia as many of the inhabitants live on the various kinds of dry or small grain, as upon rice, and they are reckoned fully as wholesome as that is.

I. 270 All kinds of cattle are remarkably fond of the straw notwithstanding its thickness, and solidity.

28. A. *cernuus. R.*

Erect, from five to fifteen feet high; lower half with verticils of roots from the joints. *Panicles* oval, with numerous, long, compound, cernuous branches; *glumes* villous and fringed. *Corol* three-valved and fringed, the inner scarce awned.

Holcus cernuus. *Linn. sp. pl. ed. Willd.* iv. 930.

This species, (or variety of *Sorghum*,) is the kind cultivated by the inhabitants of the Mechooa, Koonkee and other mountainous districts immediately east of Bengal. The grain is milk white; some of it was sown in the Botanic garden, during the early part of the rainy season of 1812, and in November the plants were from ten to fifteen feet high, several ramous stems arising from the same root, or grain of seed; all the joints of the lower half of the original [illegible] which are as thick as a slender walking cane, throw out copiously verticils of roots from [illegible] the leaves once over the soil covers it, and give additional support and nourishment to the plants, which are of two, or more years' duration, if suffered to remain the

leaves are from twenty to forty inches long, by two or three broad, soft and smooth, the rib white on both sides. Panicles large, oval on the more slender specimens, and in these, while in flower erect; but in such as terminate the primary stems, the form is obscure, from the drooping habit of their branches. The flowers agree with those of *Sorghum*, except that the awn is so small and short as to be hid within the glume of the calyx; the neuter flowers are very minute, and consist of only one or two slender, villous, calycine glumes. The grain of this plant is the staff of life of those wild savage mountaineers, who inhabit the above-mentioned countries, where it is one of the few articles cultivated by them. Cattle are fond of the straw, or rather canes, Page Carey Ed. I. 271

29. A. *saccharatus. R.*

Erect. *Panicles* verticelled, with ramifications drooping. *Calyx* hairy; *corols* awnless; hermaphrodite three-valved, neuter one-valved.

Holcus saccharatus. *Linn. sp. pl. ed. Willd.* iv. 930.

Hind. and *Beng.* Deo-dhan.

Is much cultivated over various parts of India during the rainy and cold seasons upon land which is too high for rice.

Root ramous. *Culms* erect, round, jointed, sometimes ramous, lower joints radicating from eight to twelve feet high, three or four inches in circumference near the base. *Leaves* bifarious, sheathing, sword-shaped, margins hispid, the rest smooth, with a white nerve on the upper side, three feet long, and three or four inches broad. *Sheath* as long as the panicle is when young, afterwards the whole is completely bent down from the weight of the seed. *Flowers* paired, one hermaphrodite, sessile; the other neuter, and pedicelled.

HERMAPHRODITE FLOWERS sessile. *Calyx* one-flowered, two-valved, both valves hairy. *Corol* three-valved, the solitary valve staggered; dagger, shorter than the calyx. *Seed* oval, white.

NEUTER FLOWERS pedicelled. *Calyx* two-valved, hairy. *Corol* one-valved, awnless. *Stamens* none.

Obs. The only circumstance that renders me uncertain whether this is *Holcus saccharatus* of Linnæus is the total want of the arista in the hermaphrodite flowers; in other respects they agree.

30. A. *laxus. Linn. sp. pl. ed. Willd.* iv. 907.

Erect, from one to fifteen feet high. *Panicle* ovate, lax; *ramifications* sub-verticelled, compound and decompound. *Calyx* hairy; *corols* fringed, those of the hermaphrodite three-valved, and awned.

Beng. Kula-moocha.

Teling. Gaddi-janoo. I. 272

Grows in hedges, on banks of water-courses, and on land that has lately been in cultivation.

Root somewhat woody, perennial. *Culm* near the base bending to the earth, and there rooting at the joints, the rest erect; the whole is of a firm ligneous texture, inwardly spongy, jointed, round and smooth; below naked, above covered by the sheaths of the leaves. In hedges on the banks of the rivers, &c. where the soil is good, it is often from ten to fifteen feet high; while on a barren dry soil, not more than one or two. *Leaves* long, smooth, except the margins, which are scabrous. *Panicle* very large, oval, often bowing, rather thin, composed of sub-verticelled, ramous, spreading branches, with woolly insertions; the branchlets of the branches are composed of four or six pedicelled, spiked racemes. *Rachis* of the spikes jointed, &c. *Flowers* paired, &c. as in the other species.

HERMAPHRODITE FLOWERS sessile. *Calyx* two-valved; *valvelets* equal, hairy. *Corol* three-valved, membranaceous, margins fringed with hairs; the second one retuse, with a pretty long twisted arista; the inner one very small. *Nectary* as in the last species. MALE FLOWERS pedicelled. *Calyx* as in the hermaphrodite. *Corol* two-valved.

31. A. *miliaceus. R.*

Erect, from six to ten feet high. *Panicle* ample, lax; *ramifications* verticelled, expanding, or drooping. *Corol* three-valved, in both hermaphrodite and male flowers.

The seeds of this most beautiful stately grass were sent me from Lucknow, by the late Gen. Claude Martin, under the name of hill grass. It being a native of the mountains north of Oude. It blossoms in this garden during the latter part of the rains.

Culms erect, ramous, smooth, the largest of them nearly as thick as the little finger, general height (in the Botanic garden) about ten feet. *Leaves* ensiform-lanceolate, soft, and smooth, except the margins, which are armed with minute sharp bristles, pointing forward, general length from two to three feet, and from one to two inches broad near the base, where broadest. *Sheaths* smooth, except at the mouths, and there bearded on both sides. *Panicle* very large, erect, with long, slender, smooth, elegantly drooping, verticelled, compound and decompound ramification. *Flowers* in pairs, as in the genus; one hermaphrodite, and sessile; the other male, and pedicelled. *Calyx* two-valved, one-flowered, oval, rather obtuse, and hairy, but without the characteristic woolly, or hairy involucre round the base of the flowers. *Corol* in both sorts three-valved, membranaceous, and fringed, sometimes the [illegible]. *Nectary* [illegible] broad, truncated, fringed scales. I. 273

[illegible] resembles somewhat in appearance *Andropogon laniger Desfontaines*, from the Cape of Good Hope, but is more elegant in the panicle.

SECT. IV. *Panicle foliaceous.*

32. A. *Pumilus. R.*

Page Carey Ed. Erect, twelve inches high; *panicles* composed of numerous axillary, and terminal, conjugate spikes, on long, jointed sheathed peduncles. *Calyx* of the sessile hermaphrodite, flower awned, cuspidate.

A native of Coromandel, and one of the smallest of the genus.

Culms ramous, erect, smooth. *Leaves* rather small, particularly the floral ones, which are little more than large sheaths. *Panicle* composed of numerous, axillary, and terminal, conjugate, hirsute, secund spikes, elevated on slender, jointed peduncles, embraced by many delicate, chaffy bractes at the base, and by a sheath from the joint upwards. *Flowers* in pairs on the joints of the hairy rachis, one sessile and hermaphrodite, the other peduncled and male. *Calyx* two-valved, that of the hermaphrodite flower cuspidate. *Corol* one-valved, an
I. arista occupies the place of a second in the hermaphrodite flower.
274 33. A. *parviflorus. R.*

Ascending. *Leaves* linear. *Panicle* leafy, thin; *spikelets* solitary, with proper, jointed, leafy spathes; both flowers awned, the pedicelled one a rudiment only.

A very beautiful most delicate species, a native of pasture land up amongst the Circar mountains and also of the mountains themselves.

Culms very branchy, ascending, filiform, about a foot, or a foot and a half high. *Leaves* numerous, small, linear, rather obtuse, mouths of the sheaths stipuled. *Spikes* axillary, minute, peduncled, generally one or two, rarely three. *Rachis* jointed and waved as in the other species, but here it is smooth, except at the insertions of the flowers. *Peduncles* most slender, jointed at the middle, from whence a small spathe ascends, which generally hides a part of its spike. *Flowers* in pairs; one hermaphrodite and sessile, the other merely the rudiment of a floret on a long clubbed pedicel.

34. A. *Schœnanthus. Linn. sp. pl. ed. Willd.* iv. 915.

Perennial, erect. *Panicle* sub-secund, linear, leafy; *spikelets* thereof paired, on a common, spathed pedicel, with proper pedicels and spathes; *flowers* of both sorts awnless, the male corol one-valved.

Sans. Malatr*i*nuk*u*ng, Bhoostr*i*nu*n*g.

Beng. G*u*ndh*a*-ben*a*.

Ramacciam. *Rheed. Hort. Mal.* 12. *p.* 137. *t.* 72.

Schœnanthum amboinicum. *Rumph. Amb.* 5. *p.* 181. *t.* 72. *f.* 2.

Schœnanthus, or Juncus odoratus of the *Materia Medica.* On the coast I have only found this elegant valuable species in a state of cultivation, few gardens being without it; I have but twice found it in flower and both times during the rainy season.

Root perennial, young propagating-shoots issue from the axills of the leaves that sur-
I. round a short, sub-ligneous leaf-bearing culm. *Culms* from five to seven feet high, erect, sim-
275 ple, smooth, about as thick as a goose-quill. *Leaves* many, near the root bifarious, few on the upper part of the culm, of a soft texture, pale, green colour, slightly scabrous on the margins when drawn backward against the fingers, otherwise smooth; from three to four feet long including their sheaths, and about three-quarters of an inch broad. *Floral leaves* small. *Panicle* linear, a little bent to one side, composed of many fascicles of spikes that are both terminal, and from the exterior axills. *Spikes* generally paired on a common peduncle, with a common boat-like spathe, or involucre at the division; each has also its proper pedicel, and both spathe-shaped. *Rachis* articulated, much waved, hairy. *Flowers* in pairs, one hermaphrodite and sessile, the other male and pedicelled; the last hermaphrodite flower of each spike has two males; below, only one male, as the rachis occupies the place of the other; this is the case with most of the species of the genus.

Hermaphrodite Flowers sessile. *Glume* girt at the base with wool, &c. as in the family. *Corol* two-valved, awnless. *Nectary*, two, broad, short, wedge-formed, obliquely lobed, crenulated bodies embrace the insertions of the filaments and the forepart of the germ.

Male Flowers pedicelled. *Calyx, glumes* as in the hermaphrodite ones. *Corol* one-valved, awnless. *Nectary* as in the hermaphrodite. *Stamens* three.

Obs. The fresh leaves are much used as a substitute for tea. The white succulent centre of the leaf-bearing culms is often put into curries, to give them an agreeable flavour.

35. A. *Iwarancusa. Philosoph. Transact. vol.* 80. 284. *t.* 16.

Perennial, erect. *Leaves* long, and very slender. *Panicles* linear; *spikelets* paired, five jointed, with common spathes; hermaphrodite flowers awned; male one-valved and awnless.

Beng and *Hind.* Ibharank*u*sh*a*, Iwarank*u*sh*a*, K*u*rank*u*sh*a*.

I. Iwarancussa. *Asiat. Res.* iv. 109.
276 A native of the skirts of the northern mountains of India. Dr. Blane found it between the river Raptee and the mountains, and Dr. Boyd about Hurdwar; it is therefore probably a native of a very extensive tract along the skirts of that range of mountains which bounds the plains of Bengal, Bahar, Oude, &c. Flowering time the rainy season.

It grows in large tufts, each tuft composed of a number of plants adhering together by their roots.

Root perennial, the principal parts thereof are thicker than a crow's quill, and marked with circular cicatrices, from these issue many small, firm, aromatic fibres. *Culms* erect, generally simple; from three to six feet high, smooth in every part, not hollow, but filled with a light spongy substance. *Leaves*, those near the root longer than the joints of the culm, margins hispid when the finger is drawn backwards over them, otherwise smooth in every part. *Panicle* axillary, and terminal, or the whole may be reckoned a long linear, erect, or drooping, intercepted panicle, composed of numerous, (many of them proliferous,) fascicles of slender, pedicelled,

thin spikes of five joints; each fascicle is furnished with its own proper boat-shaped spathe, besides many chaffy bractes within it among the insertions of the pedicels; and a proper spathe to each pair of spikes. *Flowers* on the body of the rachis paired; one awned, hermaphrodite, and sessile; the other awnless, male, and pedicelled, the terminal florets are three, one hermaphrodite, sesssile, and awned; the other two male, pedicelled, and awnless. Page Carey Ed.

HERMAPHRODITE. *Calyx* one-flowered, two-valved, base girt with wool, as is also the rachis, and proper pedicels. *Corol* two-valved, and fringed; inner valvelets two-parted, with a short arista in the fissure. *Nectary* two, minute, leaflets embracing the germ laterally. *Stamens*, pistil, and seed, as in the genus.

MALE. *Calyx* as in the hermaphrodite. *Corol* one-valved; *nectary* and *stamens* as in the hermaphrodite, no pistil. I.

Obs. This species comes remarkably near to A. *Schœnanthus* both in habit and taste. 277

For the virtues of the roots of this plant, see Dr. Blane's account thereof in the second part of the 80th volume of the Philosophical Transactions of the Royal Society of London; also Asiatic Researches, iv. p. 109. The virtues seem to reside almost entirely in the larger parts of the root, marked with annular cicatrices, the taste is agreeably aromatic, with some degree of bitterness.

36. A. *Martini. R.*

Perennial, erect. *Panicles* linear, sub-secund; *spikelets* paired, three-jointed, with common spathes only; hermaphrodite corols of one valve, and an awn; male awnless.

A native of the high lands of Balla-ghat. General Martin collected the seeds while there with the army, during the last war with Tippoo Sultan, and has reared abundance of it at Lucknow.

It is also now plentiful in the Company's Botanic garden, raised from seed sent from thence by that gentleman, whose name I have applied as a specific one for this elegant plant.

Root perennial, with long wiry fibres. *Culms* erect, from three to six feet high, often ramous, smooth, filled with a spongy pith. *Leaves* very long, tapering to a very fine point, smooth in every part and of a soft delicate texture. *Sheaths* shorter than the joints on full grown plants, with a membranaceous stipulary process at the mouth. *Panicles* as in A. *Iwarancusa; spikelets* paired, but with only three joints. *Flowers* also paired, &c. as in the former species, only there the lowermost pair on the most sessile of the two spikelets are both male, and one of them rests upon a smooth, convex, callous receptacle instead of a pedicel. *Rachis* jointed, and woolly. *Calyx* as in A. *Iwarancusa*. *Corol* one-valved, a long black awn occupies the place of the other, which has two small filaments near its base. *Nectary*, &c. as in the foregoing species. I.

Obs. General Martin, who sent me this grass from Lucknow, writes to the following effect:— 278

"I took particular notice of a sort of long grass which the cattle were voraciously fond of, which is of so strong an aromatic and pungent taste, that the flesh of the animals, as also the milk and butter, have a very strong scent of it. Of this grass I send you a small stalk, some roots, and seed; if you taste the latter, though old, you will find it of a very pungent aromatic taste."

PASPALUM. Schreb. gen. N. 81.

Calyx one-flowered, two-valved, valvelets rounded, equal. *Corol* of two valves, and like the calyx. *Seed* adhering to the corol.

1. P. *scrobiculatum. Linn. sp. pl. ed. Willd.* i. 330.

Spikes axillary and terminal, sessile, alternate, erect. *Flowers* alternate, in two rows, or crowded, smooth. *Calyces* from three to five-nerved. *Culms* erect, two feet high, smooth. *Seed* round, smooth.

Sans. Korudoosha, Kodruva.

Beng. Koda.

Hind. Koda-ka-choul.

Teling. Aruga.

This is cultivated by the natives over many parts of India. It delights in a light, dry, loose soil, but will grow in a very barren one. Time of cultivation the rainy season.

Root fibrous. *Culms* erect, ramous, jointed, smooth; about two feet high, involved in the sheaths of the leaves. *Leaves* sheathing, bifarious, longer than the culm, every part smooth. *Sheaths* longer than the joints, often embracing the spikes like a spathe. *Spikes* axillary and terminal, from two to four, alternate, sessile, erect, secund. *Rachis* broad, membranaceous, with a waved keel on the inside. *Flowers* oval, alternate, in two rows; in luxuriant plants the flowers are crowded without order. *Calyx; exterior* valve three-nerved; *interior* valve five-nerved. *Seeds* brown, smooth, size of those of hemp. I. 279

Obs. The seed is an article of diet with the Hindoos, particularly with those who inhabit the mountains and most barren parts of the country, for it is in such countries only where it is cultivated, it being an unprofitable crop, and not sown where others more beneficial will thrive. I have eaten of the boiled grain, and think it as palatable as rice.

2. P. *Kora. Linn. sp. pl. ed. Willd.* i. 332.

Spikes terminal, alternate; *flowers* alternate, in two rows, smooth. *Calyces* from three to five-nerved. *Culms* below procumbent, from one to eight feet high.

Page Carey Ed.

P. *orbiculare. Forst. prodr. N.* 35.

Hind. Kodu.

Teling. Neer (i. e. water) Aruga.

A native of the borders of water courses.

Root fibrous, annual. *Culms* resting on the ground near the base, above ascending, branchy, jointed, smooth; from one to three feet long. *Leaves* as in P. *scrobiculatum*, but shorter. *Spikes* generally two, or three, though in very luxuriant plants I have seen seven or eight, terminal, sessile, horizontal, and erect, the rest as in the last described species.

Obs. Cattle are very fond of these two species, whether green or dry.

3. P. *longiflorum. Linn. sp. pl. ed. Willd.* i. 332. *Retz. Obs.* iv.15.

Spikes paired, terminal, horizontal. *Calyxes* oblong, obtuse, smooth. *Culms* creeping.

Teretu-pullu. *Rheed. Mal.* 12. *p.* 81. *t.* 44.

Paspalum *longiflorum. Retz. Obs.* iv. *p.* 15.

A native of low pasture ground. Compare it with P. *distichum. Linn. sp. pl. ed. Willd.*

I. 280 i. 322.

Root creeping. *Culms* creeping, with their extremities ascending six or eight inches high, jointed, smooth. *Leaves* sheathing, alternate, bilobate, short: mouths of the sheaths bearded. *Spikes* paired, terminal, sessile, spreading, secund. *Flowers* in two rows, alternate, oblong, somewhat paired, smooth. *Calyx* and *corol* without nerves.

4. P. *longifolium. R.*

Erect, simple. *Leaves* as long as the culms. *Panicle* of many simple, alternate, diverging spikes scattered round a three-sided rachis. *Valvelets* of the calyx three-nerved. *Seed* oval, lucid, and marked with minute pits.

Of what country this is a native is uncertain. It appeared in the Botanic garden in 1807, in a place where plants from Sumatra had been planted, it is therefore more than probable that the seeds were in the earth.

Culms several from one root, simple, straight, jointed, nearly erect, round and smooth, height of the whole plant when in flower above three feet. *Leaves* long, viz. from one to three feet, sheaths included, slender, acute, smooth, except the edges which are ciliated backward. *Sheaths* longer than the joints of the culm, and smooth, except at the top, where there are a few, long, soft hairs near the short scarious ligula. *Panicle* composed of from twelve to twenty-four, simple, diverging spikes, scattered alternately round a three-sided rachis, nearly a foot in length. *Spikes* sessile, with a few, long, straight, white hairs round their insertions, about three inches long. *Rachis* flat, with a waved keel on the underside, and colored, waved margins. *Flowers* in numerous, alternate, imbricated pairs on the underside of the flat rachis, on unequal, short pedicels. *Calyx* of two, very equal, oval leaflets with a nerve or rib round the margins, and one down the middle. *Seeds* oval, dotted with innumerable, small pits, shining.

I. 281

LAPPAGO. Schreb. gen. N. 131.

Calyx from two to three-valved. *Corol* two-valved, resupine.

L. *biflora. R.*

Culms creeping. *Pedicels* two-flowered; inner valvelets of the calyx armed with hooked bristles.

Phalaris muricata. Forsk. descript. 202.

It is a small, prostrate grass, a native of the dryest pasture ground on the Coromandel coast.

Culms pressing on the earth, and striking root from the joints, from six to twelve inches long, ramous. *Leaves* short, margins ciliate, and waved: mouths of the sheaths bearded. *Racemes* terminal, simple, from one to two inches long. *Pedicels* short, diverging, two-flowered. *Flowers* lanceolate, echinated on the back, or outside, diverging on all sides round the rachis, which is waved, angular, striated, and downy. *Calyx* one-flowered, two-valved; the exterior valve very minute, second or inner valve, (for there is no other,) lanceolate and completely embracing the corol on all sides, on the back and sides covered with many, strong, hooked bristles. *Corol* two-valved, membranaceous. *Nectarial* scales large. *Stamens, pistil*, &c. as in the genus.

PANICUM. Schreb. gen. N. 107.

Calyx, glume one or two-flowered, three-valved; exterior valvelets minute; *seed* adhering to the corol.

SECT. I. *Spikes simple.*

1. P. *indicum. Mant.* 184. *Retz. Obs.* iii. *p.* 9.

Culms from four to eight inches, ascending from a repent base. *Spikes* sub-cylindric,

I. naked. *Calyx* smooth, no involucres.

282 P. *conglomeratum. Linn. sp. pl. ed. Willd.* i. 341. does not agree with our plant in having verticilled spikes with flowers equally disposed on all sides. This is a very small species, a native of Coromandel.

2. P. *barbatum. R.*

Culms from three to five feet high; very ramous at top. *Leaves* lanceolate. *Spikes*

simple, cylindric. *Involucrets* simple, and bearded, surrounding on every side a single flower; *seed* smooth. Page Carey f. d.

This species sprung up in beds, in the Botanic garden where earth had been thrown that came from Sumatra, or Amboyna. Compare with P. *polystachyon. Linn. sp. pl. ed. Willd.* i. 335.

Root annual in Bengal. *Culms* erect, about five feet high, simple, till near the top, there very ramous. *Leaves* lanceolate, often a foot and a half long, hispid on the margins, otherwise smooth; the sheaths about half the length of the joints, with a few single hairs at the mouth. *Spikes* [illegible] (these from the numerous *ramification* of the top of the culms the whole may be called a large leafy panicle) sub-cylindric, about three or four inches long. *Involucrets* of two sorts, the longer [illegible] the length of the flowers with their bristles bearded, (hence the specific name, which for the same reason is also applicable to my *Panicum holcoides,*) the innermost one is in this species about double the length of the other five, six, or seven; all are of a reddish brown colour from the bearded part to the point. The other sort of involucrets are simple and about the length of the flowers. The two sorts surround on all sides a single flower. *Calyx* one-flowered, exterior valve very minute. *Seeds* smooth, slender and pointed.

Obs. It differs from my P. *holcoides* in the culms being very ramous at the top only, and in the leaves being lanceolate; from *polystachyon* it differs, I think, in having two sorts of involucrets equally disposed round the flower, and in the leaves being lanceolate and smooth. I. 283

3. P. *spicatum. R.*

Erect. *Spikes* cylindric. *Involucres* hairy, surrounding from one to three awnless polygamous flowers. *Calyces* two-valved, both shorter than the corol, the inner longer and retuse.

Holcus spicatus. *Linn. sp. pl. ed. Willd.* iv. 928.

Gramen paniceum. *Pluck.* &c. *alm. t.* 32. *f.* 4. good.

Hind. Bajera, or Bajra.

Pedda-Gantee is the Telinga name of the plant, and Gantiloo, the grain.

I have only found this in a cultivated state. It is sown about the beginning of the rains, viz. the end of June, and the beginning of July, and is ripe in September.

Culms several, if the soil is good, from the same grain of seed, erect, with roots from the lowermost joint or two, round, smooth, from three to six feet high, and nearly as thick as the little finger. *Leaves* alternate, sheathing, broad and long; mouths of the sheaths bearded. *Spikes* or rather *racemes,* terminal, cylindric, erect, as thick as a man's thumb, or more, and from six to nine inches long. *Pedicels* generally two-flowered, though sometimes only one and sometimes as many as four. *Flowers* surrounded with many, woolly, hispid purple bristles or *involucres,* about the length of the flower. *Calyx* two-flowered, one hermaphrodite the other male, two-valved; exterior *valvelet* minute, *interior* nearly as long as the corol, retuse, [illegible]. *Corol* of the hermaphrodite flower two-valved, of the male one-valved. *Style* single. *Stigmas* two-cleft, [illegible]. *Seed* obovate, pearl-coloured, smooth.

Obs. It agrees perfectly well with our Indian species of *Panicum,* on that account I have transferred it to that genus.

This species is much cultivated over the higher lands on the coast of Coromandel. The soil [illegible] is loose and rich: in such it yields upwards of an hundred-fold, the same ground will yield a second crop of this or some other sort of dry grain during October, November, December, and January. I. 284

The Hindoo farmer knows four other varieties of this species, all of which he cultivates. Their Telinga names are: *1st. Pilla* (bleds) *Gantee; 2d. Munda-boda-Gantee; 3d. Palla-boda-Gantee;* and *4th. Yerra-Gantee.*

Cattle are fond of the straw, and the grain is a very essential article of diet amongst the natives of these parts.

4. P. *involucratum. R.*

[illegible] culms erect, many-ranked, scattered, two-flowered, alternately longer and ciliate; shorter and smooth. *Calyces* two-valved, the exterior one minute, the inner one shorter than the corol, and emarginate.

A native of mountains chiefly, where it grows wild.

Culms [illegible] from two to four feet high; joints woolly. *Leaves,* mouths of [illegible]. *Spikes* as in P. *spicatum,* but the pedicels smaller, two-flowered. *Involucre,* many bristles surrounding on all sides the flowers; they are of two sorts, simple ones awled, the longer ones with fringed margins. *Calyx* one or two-flowered; valvelets as [illegible]. *Corol* [illegible] only one to the calyx it is hermaphrodite, when two, one hermaphrodite, the other male, as in the last species. *Styles* two.

Obs. I know of no use this is put to at present; it may be *Panicum spicatum* in its wild state, though it is more like my *Panicum holcoides* in its present wild state.

5. P. *glaucum. Linn. sp. pl. ed. Willd.* i. 335.

Culms erect, from one to three feet high; *involucel* one bundle of hairy bristles, one-flowered. *Flowers* generally polygamous. *Seed* transversely rugose.

Beng. Pingi-natchi.

Teling. Naka-kora.

[illegible] cultivated lands, growing amongst the different sorts of small or dry grain. I. 285

Root fibrous. *Culms* sometimes near the base resting on the ground, and striking root; the rest erect, ramous, smooth, a little compressed; from one to three feet high. *Leaves*

Page Carey Ed. sheathing, nearly bifarious, smooth; mouths of the sheaths hairy. *Spikes* terminal, columnar, from two to six inches long. *Flowers* solitary, or joined to the rudiments of one or two more, short-pedicelled, numerous. *Involucels* longer than the flowers, consisting of one bundle of hairy bristles which issue from the middle of the underside of the pedicel. *Calyx* generally two flowers, in which case one is *male*, the other *hermaphrodite*, with its corol, as in the family. The male corol consist of one membranaceous glume between the inner valve of the *corol* and inner glume of the *calyx*, it has three stamens only.

Obs. It may propably be P. *helvolum* of the *Supplementum Plantarum*, 197.

In India we have two or three varieties of this coarse grass. Can any of them be *Alopecurus indicus?* The small reddish one comes very near it.

6. P. *holcoides. R.*

Erect. *Involucels* numerous, scattered, one-flowered, alternately one longer and woolly, and another shorter and smooth; *flowers* sometimes polygamous. *Seed* oblong, smooth, resembling a small grain of common oats.

Beng. Swati.

Grows, with the former, on cultivated lands, but chiefly up amongst the mountains.

Root fibrous. *Culms* erect, ramous, from two to four feet high, round, smooth. *Leaves* sheathing; *sheaths* half the length of the joints; mouths bearded. *Spikes* as in P. *glaucum*, but larger. *Flowers* solitary, short-pedicelled, without order. *Involucels* numerous, bristles entirely surrounding the flower; of two sorts, the largest twice the length of the flower, and woolly from the middle down, the other sort are smaller, and without wool or hair. *Calyx* one or two-flowered, as in the last; exterior valve minute, the other two as long as the corol, of which the apex of the exterior one is somewhat three-toothed. *Seed* smooth, very like common oats, but smaller.

I. 286

Obs. In differs from P. *Polystachyon* in having the involucels scattered round the pedicels and flower, It may therefore be *Rumph's gramen caricosum, vol.* vi. *t.* 7. *f.* 2. A.

7. P. *interruptum. Linn. sp. pl. ed. Willd.* i. 341.

Culms above water erect. *Spikes* simple, cylindric; *flowers* crowded, smooth, polygamous; *seed* smooth.

Beng. Nardula.

Teling. Wolam.

A very large species, grows in deep standing water.

Culms ramous, those parts under the water swelled, as thick as the little finger, with many fibres from the joints; the parts above the water erect, about as thick as a common quill, from two to four feet high, smooth, involved in the sheaths of the leaves. *Leaves*, sheaths longer than the joints, smooth. *Racemes* or *spikes* simple, erect, columnar, from four to six inches high. *Flowers* small, oval, pedicelled, numerous, generally many, from nearly the same place. *Involucre* entirely wanting. *Calyx* two, inner glumes striated, from six to seven-nerved. *Corol*, the small flower is present here. *Seed* oblong, smooth, shining, white.

8. P. *curvatum. Linn. sp. pl. ed. Willd.* i. 352.

Culms erect. *Spikes* curved; *flowers* crowded, smooth, hermaphrodite; *seed* smooth.

Grows about the borders of lakes.

Culms numerous, ramous, erect, as thick as a crow's quill, from two to three feet high, smooth. *Leaves* numerous, very long, slender, and smooth. *Racemes*, or *spikes* columnar; lower part somewhat ramous; branchlets adpressed. *Flowers* numerous, covering most completely every part of the racemes, pedicelled, oval. *Calyx*, two inner glumes striated. *Corol* no neuter, only one hermaphrodite. *Seed* smooth, shining, white.

I. 287

Obs. This may be only a variety of P. *interruptum.*

9. P. *dimidiatum. Linn. sp. pl. ed. Willd.* i. 339.

Spikes secund, jointed; joints excavated, daggered on alternate sides of the apex, from one to five-flowered. *Calyx* two-flowered, one hermaphrodite, the other male.

A native of the Peninsula of India, scarce.

Culms short, oblique, smooth; whole height from six to twelve inches. *Leaves* slender, smooth, obtuse, rather broad toward the apex. *Spikes* solitary, secund, jointed, smooth, from three to five inches long. *Joints* of the *rachis* from eight to twelve, rigid, excavated for the reception of the flower, except the lower one or two, which are longer; in all except these a long sharp point or dagger proceeds from the apex, on the alternate sides of the articulation. *Flowers* lodged in the concave joints of the rachis, on very unequal pedicels, the lowermost having each three or more, while those about the middle of the spikes have uniformly two, and the last two or three only one. *Calyx* two-flowered, two-valved; flowers both sessile, one hermaphrodite, the other male; valves unequal, the exterior one smaller; the inner one about as long as the valve of the corol, or it may be described with three valves as in the genus; but then the male flower will have but one glume. *Corols* two-valved; valves nearly equal, those of the male flower much firmer, the sides of the exterior one (which may be called the inner valve of the calyx, if it be allowed, to have three), with the sides bent in at right angles. *Stamina* three. *Germ* in the hermaphrodite flower oblong. *Style* undivided for a short distance. *Stigma* plumose. *Seed* oblong, dark brown, dotted; on the anterior side near the base is an oblong elevated mark.

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Obs. Dr. Rottler, of Madras, an excellent Botanist, obliged me with the only specimens of this rare grass which I have yet met with, and had he not informed that this was considered to be P. *dimidiatum* I should have been inclined to have taken it for an *Ischaemum.*

SECT. II. *Spikes paired.*

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10. P. *conjugatum. R.*

Spikes conjugate, secund. *Flowers* solitary, sessile, awnless. *Corol,* with an accessary neuter valve.

A slender, soft, villous, half creeping species; a native of Coromandel. It differs from P. *distachyon* in the number of the spikes being constantly two, and the flowers always solitary and sessile. To these marks of distinction may be added that the valves of the calyx are three-nerved, and the accessary one particularly large.

11. P. *squarrosum. Linn. sp. pl. ed. Willd.* i. 345. *Retz. Obs.* iv. 15. and v. *t.* 1.

Culms creeping, from ten to twenty inches long. *Spikes* paired, horizontal, *rachis* articulate; *flowers* in a fascicle on the upper end of each joint of the rachis.

Cenchrus muricatus. *Mant.* 302.

P. *dimidiatum. Burm. Ind.* 25. *t.* 8. *f.* 2.

A native of dry sandy ground near the sea.

Culms branchy, creeping, with their flower-bearing extremities sub-erect; from ten to twenty inches long. *Leaves* short, but rather broad, and covered with soft hair; *sheath* large, downy, involving most of the culms. *Spikes* two, terminal, spreading, horizontal, or ascending like a pair of horns, secund. *Rachis* composed of from four to eight, oblong joints, divided by a waved ridge; on each side of the ridge membranaceous. *Flowers* collected in sessile bundles of from four to eight, alternately disposed on the upper end of each joint. *Calyx,* the *exterior* one minute, and lanceolate; the *second* large, embracing loosely the corol, pointed, and striated; the *inner* one nearly as small as the *exterior,* tapering from the base to a fine point, three-nerved; margins fringed, of a chaffy texture. *Corol* as in the genus, and rather longer than the inner glume of the calyx, here is a third neutral membranaceous valve, as in many species of this genus. I. 289

SECT. III. *Spikes fascicled.*

12. P. *Dactylon. Linn. sp. pl. ed. Willd.* i. 342.

Smooth, creeping. *Spikes* digitate, secund, corol gibbous on one side, and twice as long as the calyces.

Agrostis linearis. *Linn. sp. pl. ed. Willd.* i. 375. *Retz. Obs.* iv. *N.* 51. Sir W. Jones. *Asiat. Res.* iv. *p.* 248.

Sans. Doorva, Shutupurvika, Suhusruveerya, Bharguvee, Ourooha, Ununta.

Beng. Doorba.

Teling. Ghericha.

Tam. Arugam-pilla.

This is by far the most common and useful grass in India. It grows every where abundantly, and flowers all the year.

Root creeping. *Culms* creeping, with their flower-bearing branchlets erect, from six to twelve inches high, smooth. *Leaves* small, and smooth. *Spikes* from three to five, terminal, sessile, filiform, expanding, secund, from one to two inches long. *Rachis* waved. *Flowers* alternate, single, disposed in two rows on the underside. *Calyx* much smaller than the corol. *Corol,* the large or exterior valve boat-shaped, keel slightly ciliate. *Stigmas* villous, purple.

Obs. This most valuable grass forms three-fourths of the food of our horses and cows in India. It is by the brahmuns of the coasts held sacred to *Gunesha,* (the *Janus* of the ancients,) under the name of *Doorwall.*

13. P. *aegyptiacum. Linn. sp. pl. ed. Willd.* i. 343.

Creeping at the base. *Spikes* from four to eight; corymbed, smooth. *Flowers* paired on unequal pedicels; accessary valve of the calyx minute or wanting, the other two very unequal, nerved, and ciliate on the margins only. I. 290

Obs. Is rather a scarce grass in India, and grows in tufts. Cattle do not seem fond of it, whereas all are fond of *Dactylon.*

14. P. *ciliare. Linn. sp. pl. ed. Willd.* i. 344.

Culms creeping at the base. *Spikes* sub-digitate. *Flowers* paired, one sessile, the other pedicelled; inner two valves of the calyces equally long, and bearded with four woolly ridges; third minute.

Hind. Makur-jalee.

Teling. Shangali-gaddi.

It delights most in newly laid down pasture ground.

Culms creeping, with one or two feet of the extremities erect, these ramous, round and smooth. *Leaves* sheathing, short for the size of the grass; margins ciliate near the base; *sheaths* sometimes a little hairy, shorter than the joints of the culm, their mouths rise above the insertion of the leaf, stipule-like, as in Dr. Smith's *Erharta calycina,* but here it is entire. *Spikes* or rather spiked-racemes, from four to ten, digitate, expanding, secund. *Flowers* paired, one sessile, one peduncled. *Rachis* three-sided, waved. *Calyx, exterior* valve most minute. *Interior* two, many-nerved, four of the nerves are clothed with very long, white, soft hairs.

Obs. Small plants on a poor soil, have much the appearance of *Agrostis radiata.* Cattle are very fond of this grass.

15. P. *filiforme. Linn. sp. pl. ed. Willd.* i. 343.

Creeping, [illegible]. *Spikes* from two to four, sub-digitate, filiform, secund;

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flowers paired, one sessile, the other pedicelled. *Calyx* with the accessary valve, minute; inner one half the length of the corol or middle one; these last two are three-nerved, and villous on the margin.

From China it was brought to the Botanic garden, where it thrives well, and blossoms the whole year, but chiefly during the rains.

Culms ramous, creeping, very delicate, and smooth, a large portion next the spikes erect, naked, coloured and filiform. *Leaves* soft and small, ciliate, with a few long hairs at the base. *Spikes* generally from two to four issuing from the same point, very slender, secund. *Rachis* flexuose. *Flowers* in a pair, one sessile. *Calyx* one-flowered, flower hermaphrodite; *accessary* valve exceedingly minute, but by careful observations may always be found; second valve as long as the corol, the inner one only half their length, which is one of the best specific marks; these two have three smooth nerves on the back, and their margins are slightly bearded. *Corol* two-valved.

16. P. *lineare. Linn. sp. pl. ed. Willd.* i. 344.

Sub-erect, smooth. *Spikes* from two to six, digitate, filiform. *Flowers* all hermaphrodite, awnless, and pedicelled. *Calycine* valves, the accessary one minute; the inner two equalling the corol, and three-nerved.

P. *lineare. Burm. Ind. p.* 25. *t.* 10. *f.* 3, is a tolerable representation of this pretty delicate grass.

A native of China, accidentally introduced from thence into the Botanic garden, where it is in flower the whole year; but like most other grasses most luxuriant during the rains. It has a great resemblance to P. *dactylon, ciliare, filiforme,* and *aegypticum,* but does not creep like them. The flowers are less regularly paired, more minute, smooth, and obtuse, the two inner valves of the calyx equal and as long as the corol, and the accessary one very minute, or not to be found.

17. P. *cimicinum. Linn. sp. pl. ed. Willd.* i. 344.

Culms erect, hairy, from one to two feet high. *Racemes* peduncled, corymbed; *flowers* polygamous, in pairs; exterior valvelets of the calyces fringed; *corol* awned.

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Milium cimicinum. *Mant.* 184.

A rare plant, native of ground that has been lately in cultivation.

Culms from one to two feet high, sub-erect, hairy. *Leaves* short and broad, hairy, and fringed round the margin; *sheaths* also hairy. *Racemes* from four to ten; when more than four or five, the rest are elevated on a common peduncle above the point from whence the first four or five issue; all are pedicelled, bowing, secund. *Flowers* in two rows and in pairs, scarcely ever single. *Calyx*, border of the inner valve fringed with red hairs. *Corol*, the arista is sometimes wanting, and its valves three-nerved; in mine there is a second, or male floret, as in many species of *Panicum.*

18. P. *corymbosum. R.*

Sheaths of the leaves bristly. *Spikes* numerous, corymbed. *Calyces* two-valved. *Seeds* oblong, smooth.

Teling. Cheepa-bora-gaddi.

This species I have found only in the vallies amongst the Circar mountains; it grows to a great size in standing sweet water.

Culms of great extent, creeping, or floating, with their extremities erected above the water; on dry ground I have also found it, where it is in general from one to four feet high. *Leaves* as in other grasses; *sheaths* covered with stiff white hairs. *Spikes* corymbed, numerous; from four to eight inches long, filiform, sub-erect, secund, level-topped. *Rachis, common* striated; *partial* three-sided. *Flowers* oblong, in two rows, paired; one very short pedicelled, the other longer. *Calyx* two-valved; the exterior valve small, the other as large as the corol, and striated, but no third or inner valve. *Corol* as in the family. *Seed* oblong, smooth, white.

SECT. IV. *Spikes alternate on one side only of a common rachis.*

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19. P. *brizoides. Linn. sp. pl. ed. Willd.* i. 338.

Culms sub-erect. *Leaves* short. *Spikelets* remote, adpressed. *Flowers* oval, solitary, polygamous; inner two valves of the calyx equal; nectarial petals long; *seed* ovate, pointed, rugose.

P. flavidum. *Linn. sp. pl. ed. Willd.* i. 339. *Retz. Obs.* iv. 15. appears to be the same plant growing on a barren soil; this was the opinion of König. P. *flacidum* of the *Banksian Herbarium* seems the same, or a variety only.

Teling. Oda, or Woodoo-gaddi.

It is common in every soil and situation, even in deep water; in one that is rich and moist, it is often two to four feet long, and again on one that is dry and barren only as many inches. It grows in tufts, various parts of it are often tinged purple.

Culms near the base resting on the ground, and rooting above, regularly ascending, compressed, smooth. *Leaves* bifarious, smooth, their length differs much; *mouths* of the sheaths bearded. *Spikes* compound, secund, their length various according to the size of the plant. *Spikelets* secund, number very various, alternate, erect, pressing on the common rachis; below they are often two or three times their length from each other; above less remote. *Rachis common*, somewhat three-sided, and a groove on the outside where the spikelets rest. *Flowers* always disposed in two rows, sub-globular. *Calyx* two-flowered. Inner valve the size of the corol, middle valve rather shorter; all are striated with green nerves. *Corol*, one *hermaphrodite*, and one *male*, as in some of the species already described, always present, except in very minute plants, and even then the stamens of the second floret are only sometimes

wanting. *Nectary,* in each two obovate scales. *Seed* short, oval, pointed, slightly rugose. Page Carey Ed.

20. P. *fluitans. Linn. sp. pl. ed. Willd,* i. 338.

Culms from two to three feet high, creeping at the base. *Leaves* long. *Spikelets* numerous, approximate, longer than the interstices. *Flowers* hermaphrodite, oblong, two exterior valvelets of the calyces minute; *seed* oblong. I.

Beng. Peti-nar. 294

Teling. Doosa.

Delights in a moist rich soil, such as the banks of water-courses, borders of rice fields, &c.

Culms at the base creeping, above nearly erect, round, smooth, from one to four feet long, including the part that rests on the ground. *Leaves* smooth, except about the mouths of the sheaths where they are bearded, and sub-ciliate. *Spike* compound, secund, exceedingly like that of P. *brizoides,* only here it is generally longer, with often as many as twenty-five or thirty spikelets; their distance from one another is not so regular and is generally less than their own length. *Flowers* disposed in two rows on the outside of the spikelets, which are oblong. *Calyx* one flowered, the two exterior valves very small. *Seed* oblong, pointed, rugose.

21. P. *lanceolatum. Linn. sp. pl. ed. Willd.* i. 337.

Culms creeping. *Leaves* lanceolate, mouths of their sheaths elevated and bearded. *Flowers* hermaphrodite; valvelets of the calyces equal, the exterior one awned. *Seed* smooth, oblong.

P. *aristatum,* of the same author, seems the same grass.

Compare with P. *compositum. Linn. sp. pl. ed. Willd.* i. 346. In the *Banksian Herbarium* the same species is labelled P. *unguinosum.* Grows under the shade of trees.

Culms creeping, ramous, with their extremities, from one to two feet high, sub-erect. *Leaves* lanceolate, waved, often tinged with purple; *sheaths* shorter than the joints, hairy; *mouths* elevated, stipula-like, and hairy. *Spikes* composed, secund; from six to twelve inches long. *Spikelets* alternate, somewhat remote, secund, direction between expanding and adpressed. *Rachis,* common and partial three-sided. *Flowers* generally paired, one sessile, the other short-pedicelled; insertions often surrounded with hairs, when single there is an awn, or the rudiments of a second floret accompanying it. I.

Calyx, the exterior glume as large as the next within it, and ending in a long waved, 295
purple awn; exterior glume rather longer. *Corol* no *neuter,* nor *male* floret. *Seed* oblong, smooth, slightly three-nerved.

Obs. Cattle are not fond of it.

22. P. *Burmanni. Linn. sp. pl. ed. Willd.* i. 339. *Retz. Obs.* iii. *N.* 16.

Culms creeping. *Leaves* lanceolate, hairy; *flowers* hermaphrodite; all the valvelets of the calyces hairy, and awned. *Seed* slender, smooth, pointed.

P. *hirtellum. Burm. Ind.* 24. *t.* 12. *f.* 1.

Hippogrostis amboinica. *Rumph. Amb.* iv. *p.* 14. *t.* 5. *f.* 3.

This species is always found on pasture ground, under the shade of large trees.

Culms creeping, branchy, with their extremities erect. *Leaves* sheathing, lanceolate, waved, hairy; sheaths half the length of the joints; very hairy. *Spikes* compound, secund, erect. *Spikelets* from four to eight, alternate, secund, adpressed. *Rachis,* common and partial, three-sided. *Flowers* generally paired; one sessile, the other pedicelled. *Calyx,* the two exterior glumes are hairy, and have long awns, that of the inner is shorter and smoother.

23. P. *stagninum. Linn. sp. pl. ed. Willd.* i. 337.

Culms from one to four feet high. *Leaves* smooth. *Flowers* polygamous, three-fold, subsessile. *Calyces* hairy, and hispid; inner valvelets awned.

Beng. Dul.

Teling. Pedda-woondoo.

Delights in wet, cultivated, paddy lands.

Culms, towards the base resting on the ground, and striking root; above erect, which part is from one to four feet high. *Leaves* smooth, soft, with only the mouth of the sheaths ciliate. *Spikes* compound, secund, erect. *Spikelets* alternate, sessile, secund, expanding a little. I.
Rachis, both common and partial three-sided. *Flowers,* very numerous; three-fold below, 296
above in pairs, all sessile, or nearly so; their insertion surrounded with small bristles involucre-like. *Calyx,* only the inner valve awned, all striated, hairy and hispid. *Corol* complete; *male* florets, besides the usual hermaphrodite one.

Obs. This is a coarse species. Cattle are not fond of it.

24. P. *crus corvi. Linn. sp. pl. ed. Willd.* i. 337.

Culms creeping at the base. *Leaves* downy. *Spikes* from six to ten, three times longer than their interstices. *Calyces* downy. *Corol* three-valved. *Seed* oblong, obtuse, smooth.

A middle-sized, delicate, rare species, found on pasture ground. *Culms* filiform, creeping at the base, above nearly erect. *Leaves* soft, downy; sheath hairy. *Spikes* compound, secund, from one to three inches long. *Spikelets* from four to twelve, alternate, adpressed, secund, about three-fourths of an inch long; sometimes there is a very small ramification at the lower part of one or two. *Rachis* common, two-furrowed; partial, three-sided, downy. *Flowers* [illegible] *calyx* striated, very downy. *Corol,* the neuter valve is here present. *Seed* oblong, smooth, shining white.

25. P. *colonum. Linn. sp. pl. ed. Willd.* i. 338.

Culms creeping at the base. *Spikes* from six to ten, secund. *Flowers* three-fold, sub-sessile,

Page Carey Ed. *Glumes* of the calyces three-nerved. *Corol* three-valved. *Seed* roundish, smooth, three-nerved.

Beng. Shama. There is a reddish variety, called *Lat-shama.*

Teling. Woondoo-gaddi.

Delights in rich pasture ground.

I. 297 *Culms*, below resting on the ground, and rooting; above sub-erect, that part is from one to two feet high, branchy, a little compressed, smooth. *Leaves* tending to be bifarious, short, smooth, tapering from the base to a sharp point. *Spikes* compound, secund. *Spikelets*, from six to twelve, alternate, somewhat remote, secund. *Rachis* both common and partial three-sided; the two sides from whence the spikelets issue concave. *Flowers* two or three from the same point, generally three; all sessile, or very nearly so; sometimes a few small bristles mixed with them. *Calyx* as in the genus, all the glumes three-nerved, a little hairy, and scabrous. *Corol*, the neuter valve is here present, but no stamens. *Seed* broad, oval, smooth, a little pointed, three-nerved.

Obs. Cattle are very fond of it, yet it is not cultivated in these parts.

26. P. *grossarium. Linn. sp. pl. ed. Willd.* i. 349.

Culms creeping. *Leaves* soft and downy. *Spikes* from six to ten; *flowers* solitary, sub-sessile. *Corol* three-valved. *Seed* oblong, acute, transversely rugose.

Loves fresh pasture ground.

Culms, in a good soil creeping to a great length, in a poor soil nearly erect. *Leaves*, tapering from the base to a fine point, somewhat downy, and very soft. *Spikes* compound, secund. *Spikelets* from four to twelve, alternate, secund, expanding on one side, most simple, in two rows. *Calyx* pretty smooth. *Corol*, the neuter valve is always present. *Nectary* a rugose gland between the germ and exterior valve of the corol. *Seed* oblong, white, slightly rugose in a transverse direction.

Obs. The form and rugosity of the seed distinguish it from P. *colonum*, the flowers also are here single, there two or three from the same point.

27. P. *umbrosum. Linn. sp. pl. ed Willd.* i. 343.

I. 298 *Culms*, at the base creeping. *Leaves* soft. *Spikes*, from six to ten; *flowers* paired on a common pedicel. *Corol* three-valved. *Seed* ovate, longitudinally streaked, and transversely rugose.

This is also a native of pasture ground, but chiefly that which is shaded. It is exceedingly like the last described species.

Culms creeping, &c. as in the last. *Leaves* also the same. *Spikes*, the same as in P. *grossarium*. *Spikelets* or rather *racemes*, the lower one or two sometimes branchy in luxuriant plants. *Rachis*, common, striated; partial three-sided, and downy. *Flowers*, the inferior ones in pairs, upon a short, common pedicel; besides, having their partial pedicels, one of which is nearly as long as its flowers; above they are often single, and somewhat remote; hairs surround the insertion of all. *Calyx* hairy. *Corol*, the neuter valve is here present. *Seed* ovate, a little pointed, rugose, like that of the last species.

Obs. The chief character consists in the lower flowers of the racemes being paired on a common peduncle, with pedicels of very unequal lengths and hairy involucres.

28. P. *cuspidatum. R.*

Creeping near the base, wholly smooth. *Leaves* linear, without ligula. *Spikes* compound, secund; *spikelets* adpressed, secund. *Flowers* from one to three, equally sub-sessile, all hermaphrodite; *valves* of the calyx three-nerved, and cuspidate. *Seed* cuspidate.

A native of Bengal. Found in a rich moist soil, in flower and seed in April.

Culms, numerous in luxuriant tufts, creeping near the original root, then ascending to about two feet in height, ramous, smooth. *Leaves* ensiform, smooth, with coloured margins. *Sheaths* shorter than the joints, smooth, and completely destitute of ligula. *Spikes* compound, secund, slightly recurvate, with the secund spikelets on the convex side pressing on the com-
I. mon, three-sided, hispid rachis; often of a dull purple colour. *Flowers*, from one to three
299 together, and equally sub-sessile. *Calyx*, all the glumes three-nerved, and cuspidate, and generally armed with a few minute bristles. *Corol* three-valved; the third or accessary one membranaceous, and neuter. *Seeds* ovate, smooth, cuspidate.

SECT. V. *Spikes alternate on all sides of a common rachis.*

29. P. *setigerum. Linn. sp. pl. ed. Willd.* i. 338.

Culms, below creeping, sub-ligneous. *Leaves* with cordate base and ciliate margins. *Insertions* of the *spikelets* and *flowers* bristly. *Corol* three-valved. *Seed* oval, transversely rugose.

Beng. Bura-jal-ganti.

P. *setigerum. Retz. Obs.* iv. 15.

Grows amongst bushes or under the shade of trees.

Culms long, straggling, rooting when they rest on the ground, firm, almost woody towards the base, but small, and very smooth; joints downy. *Leaves* sheathing, broad-cordate at the base, tapering from thence to the point; margins ciliate, and waved; mouths of the sheaths bearded. *Spikes* compound. *Spikelets* from four to twenty, secund, spreading, disposed equally on all sides. *Rachis*, common four, five, or six-sided, partial three-sided. *Flowers* paired; pairs alternate, in two rows, one sessile, one pedicelled, intermixed with many long strong hairs, like an involucre. *Calyx*, the two inner glumes downy and striated lengthways with many green nerves. *Corol*, the neuter membranaceous, valve always present, but no

stamens. *Seed* oval, transversely rugose. Page Carey Ed.

Obs. When exposed to the weather, the leaves are of a smooth shining deep green, when under trees, of a pale colour, soft, and somewhat downy, which made me long think they were different species. Cattle are fond of it.

30. P. *repens. Linn. sp. pl. ed. Willd.* i. 347.

Creeping. *Leaves* broad, waved, base cordate, stem-clasping, and ciliate. *Spikes* from four to ten, equally disposed on all sides. *Flowers* awnless; *involucre* hairy. *Corol* three-valved. I. 300

P. *repens. Burm. Ind. t.* 11. *f.* 1. is like this, only the partial spikes are rather too long, and the leaves too narrow.

Common about the beginning of the rains on cultivated lands, in gardens, &c. near Calcutta. It is a pretty, cespitose species which cattle are fond of.

Culms, creeping to the extent of from one to two feet, geniculate, smooth, often coloured. *Leaves* lanceolate, base cordate, stem-clasping, and ciliate. *Sheaths* shorter than the joints, somewhat hairy. *Spikes* from four to ten, small, short, sessile, secund, equally inserted on the four or six-sided, villous rachis. *Flowers* generally paired, and both unequally pedicelled, with an involucre of long soft hairs on the outside of the pedicel. *Calyx; exterior* valve minute, and truncate; the *inner* two equal, five-nerved. *Corol*, with neuter valve.

31. P. *hirsutum. Kön.*

Leaves broad-lanceolate, with cordate, stem-clasping base, waved, ciliate, and hairy. *Flowers* polygamous, solitary, sessile. *Seed* ovate, transversely rugose.

Hind. Jal-ganti.

Teling. Salla-woodoo.

Is found on the borders of cultivated land, on pasture ground, &c.

Culms, spreading at the base; resting on the ground and rooting; above ascending; *joints* downy. *Leaves* broad, base cordate and embracing the culms, much waved, hairy, with the edges ciliate; sheaths also hairy with a thick beard round the mouths. *Spikes* composed of six or twelve, simple, alternate, secund, expanding spikelets, surrounding a common, four or five-sided, hairy rachis. *Partial, rachis* three-sided, hairy. *Flowers* in two rows, single, alternate, sessile, often intermixed with bristles. *Calyx*, all the valves hairy and striated. *Corol*, a complete, one-valved male floret in the same calyx with the hermaphrodite. *Seeds* ovate, transversely rugose, white, daggered. I. 301

Obs. Cattle are very fond of it.

32. P. *tomentosum. R.*

Culms sub-erect. *Leaves* hairy; *spikes* from ten to twelve, oblong, from six to eight-flowered, intermixed with hispid bristly involucels. *Seed* ovate, transversely wrinkled.

This is a delicate, rare species, found growing in tufts, or dry pasture ground over various parts of India.

Culms ascending, compressed towards the base, branchy, from twelve to eighteen inches high. *Leaves* soft, covered with much, long, soft hair; *sheaths* half the length of the joints; *mouth* bearded. *Spikes* compound, terminal, consisting of ten or twelve (generally alternate, though sometimes in pairs) *spikelets* of six or eight flowers, intermixed with hispid bristles, they are not placed on one side, but round the common rachis, which is generally three-sided. *Calyx*, the two interior valves five-nerved; the second, half the length of the corol, as in P. *glaucum*. *Corol* has a third neuter valve. *Seed* transversely wrinkled, as in P. *glaucum*.

33. P. *verticillatum. Linn. sp. pl. ed. Willd.* i. 334.

Spikes cylindric. *Spikelets* quatern, sub-verticelled. *Involucels*, backwardly hispid bristles. *Seeds* oblong, three-nerved, and rugose.

Hind. Dora-byara.

Teling. Chicklenta.

Delights in a rich soil in out of the way corners, where there is rubbish, &c.

Culms, below resting on the ground and striking root, above weak, often leaning over to one side, smooth, length of the creeping part, from one to two feet, and that of the more erect culms from one to two feet. *Leaves* sheathing, linear-lanceolate, a little downy; margins hispid when felt backwards; mouths of the sheaths hairy. *Spikes* columnar, compound, from three to four inches long, generally matted together by means of the bristly involucels. *Spikelets* or rather *racemelets*, tending to be verticelled, generally four in the verticel, composed of three or four short pedicels, each bearing a few flowers; all intermixed with very stiff bristles (*involucels*) armed with short, stiff, recurved points, by which they adhere firmly to every thing that touches them. *Calyx* as in the family. *Corol*, a third neuter valve, but no stamens to it. *Seed* three-nerved, and slightly waved across. I. 302

Obs. Cattle will not eat it, so that it is reckoned a troublesome weed wherever it is found.

Plants reared from English seed, were not near so luxuriant as those of India, but evidently the same species. Thunberg's large cultivated variety is certainly *Panicum italicum*. Curtis's figure in his *Flora Londinensis* is represented with the leaves broader at the base than our Indian plant, or even than in plants reared in India from English seed.

34. P. *italicum. Linn. sp. pl. ed. Willd.* i. 336.

Culms erect. *Spikes* nodding; *spikelets* scattered, ovate; *pedicels* from two to three or four-flowered, with smooth bristles intermixed. *Seed ovate*, three-nerved.

Panicum. Rumph. Amb. v. *p.* 202. *t.* 175. *f.* 2.

Sans. Kungoo, Priyungoo.

Beng. Kungoo, and Kungnee.

Hind. Kora.

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Teling. Kora ; Koraloo, the grain.

This is one of the plants call dry or small grain. It is cultivated in many parts of India, and requires an elevated, light soil. I never saw it wild.

Culms several from one grain of seed, erect, from three to five feet high, round, smooth ; roots issuing from the lower joints. *Leaves*, margins backwardly hispid ; mouths of the sheaths bearded. *Spikes* compound, &c. There is more or less of a third, or neuter valve on the corol.

Obs. Small plants have the spike more erect, and uniform, without vacancies between the racemelets.

The seed is an article of diet with the natives. It delights in a light, elevated, tolerably dry soil. Seed time for the first crop, about the months of June and July ; harvest time in September ; produce about fifty-fold in a favourable season. A second crop may be had from the same ground, between September and the end of January.

35. P. *strictum. R.*

Culms straight, from two to three feet high. *Spikes* compound, cylindric, straight, with numerous expanding spikelets. *Glumes* of the calyx hairy, and acute. *Corol* three-valved, the innermost one awned.

Beng. Gang-bena.

A native of Bengal, where it is found, though rarely, on dry barren spots.

Culms straight, from one to three feet high, slender as a crow's quill, hairy, particularly at and near the joints. *Leaves* short, straight, broadest at the base, and from thence tapering to a fine point ; a little hairy, particularly underneath. *Sheaths* more hairy, their mouths bearded with much long, soft, white hair. *Spikes*, (panicles) cylindric, straight, composed of numerous, one-ranked, expanding, short spikelets. *Flowers* paired, on shorter and longer pedicels which unite before their insertions into the rachis of the spikelets. *Calyx*, valvelets acute ; two exterior with a few straight hairs, inner one smooth ; corol-like. *Corol* three-valved, the inner and smaller one awned.

36. P. *hispidulum. Retz. Obs.* v. *p.* 18. *Linn. sp. pl. ed. Willd.* i. 346.

I. 304

Culms erect, from three to four feet high. *Spikes* panicled, erect, lanceolate ; *spikelets* secund ; *flowers* two-fold, both sub-sessile ; *valvelets* of the calyx bristly, the middle one daggered, the inner one awned. *Corol* three-valved. *Seed* ovate, pointed, polished.

Beng. Bura-Shama.

Grows on the borders of rice lands, and rich moist places. Is never cultivated nor made any use of.

Culms erect with a few erect branches: *Leaves* long, narrow, fine-pointed, smooth. *Spikes* straight, panicled, composed of numerous, secund, erect spikelets, surrounding the common four, five, or six-sided rachis. *Flowers* numerous, almost always two together and equally sub-sessile. *Calyx*, all the three valves harsh with numerous sharp bristles issuing from the nerves of the glumes. The two exterior ones with sharp subulate points ; the inner one ends in a pretty long, strong, hispid arista. *Corol*, with a third, membranaceous, neuter valve. *Seed* ovate, pointed, polished.

Obs. It comes near my P. *frumentaceum*, and may probably be the same in its wild state.

37. P. *frumentaceum. R.*

Culms erect, from two to four feet high. *Panicle* erect ; *spikes* secund, incurved ; *flowers* three-fold, unequally pedicelled. *Valvelets* of the calyces daggered, or awned ; *seed* ovate, smooth.

Sans. Shyamaka.

Beng. Shama.

Teling. Bonta-shama ; shamaloo, the grain.

This I have only found in a state of cultivation, it delights in a light, tolerably dry, rich soil ; the same ground yields two crops between the first of the rains in June, July, and the end of January.

I. 305

Culms erect, ramous, a little compressed, smooth, from two to four feet high. *Leaves* large, margins hispid. *Panicle* erect, oblong, rigid, composed of numerous, secund, condensed, incurved spikes ; they entirely surround the common rachis and sometimes tend to be verticelled. *Rachis, common* five or six-sided, a little hairy ; *partial* three-sided, waved. *Flowers* almost always three from the same point, one sessile, the second short pedicelled, and the third a little longer pedicelled. *Calyx*, with all the glumes three-nerved ; the two large daggered. *Corol*, with a third neuter valve. *Seed* ovate, pointed, smooth,

Obs. There are several varieties of it known to the Hindoo farmers. The seed is wholesome and nourishing, it is an article of diet, particularly amongst the lower classes of the natives. It yields about fifty-fold in a good soil. Cattle are fond of it.

SECT. VI. *Panicled.*

38. P. *trigonum. Linn. sp. pl. ed. Willd.* i. 352.

Culms creeping. *Panicle* halved. *Leaves* stipuled. *Pedicels* two-flowered. *Inner* valve of the calyces vaulted. *Corol* three-valved. *Seed*, half round, smooth.

Grows on pasture ground, under the shade of trees, &c.

Culms creeping, filiform, from one to two feet long, with a few inches of the extremities erect. *Leaves* lanceolate, soft, a little downy ; *sheaths* ciliate, with a stipule-like process. *Panicle* halved, oblong, smooth, composed of from three to ten ramous branchlets, rising on one side only when the plant is small ; *pedicels* two-flowered. *Partial pedicels* unequal.

Calyx, inner valve cucullate, obtuse; all the valves striated and hairy. *Corol*, with a neuter, but small valve. *Seed* smooth, obtusely and obliquely three-sided. Page Carey Ed.

39. P. *patens. Linn. sp. pl. ed. Willd.* i. 352.

Culms creeping. *Leaves* with a cordate base. *Panicle* oblong. *Pedicels* one-flowered. The three valvelets of the calyces equal. *Flowers* polygamous. *Seed*, flat on one side, smooth.

A small, delicate, creeping species; it delights in shady pasture ground. I. 306

Culms like those of P. *trigonum*. *Leaves* broad, with a cordate base, from thence tapering to a fine point, downy; *sheaths* hairy, their mouths want the stipule-like process. *Panicle* small, about one and a half or two inches long, oval, ramous; *ramifications* smooth. *Flowers* oval, solitary. *Calyx*, two-flowered, the three valves are nearly equal, all smooth but striated; the inner one appearing more like a second valve to the male floret than one of the calyx, and the more so as it drops off with the seed, leaving the two exterior ones behind. *Corol*, one male, or sometimes one neuter, and one hermaphrodite. *Seed* oval, smooth.

40. P. *brevifolium. Linn. sp. pl. ed. Willd.* i. 353.

Culms creeping. *Leaves* lanceolate, cordate. *Panicle* ovate, very ramous, partly hid in the sheath of the exterior leaf, second valvelet of the calyces bearded; *corol* three-valved. *Seed* ovate, smooth.

Grows, with the two preceding species on shaded pasture ground, and is very much like them.

Culms creeping, as in the two last described species, but rather more robust. *Leaves* broad, and somewhat cordate at the base, waved; margins of the sheaths ciliate. *Panicle*, the lower part always confined within the sheaths of the extreme leaf, oval, from three to five inches long, composed of numerous very fine capillary ramifications, the common raciis and larger branches very woolly. *Flowers* obliquely-oval, numerous, on very fine, long pedicels. *Calyx*; the *exterior* valve lanceolate, the second boat-shaped, with the outside covered with very long soft wool, the third oval. *Corol*, with a neuter valve, but no stamen. *Seed* oval, smooth, white.

41. P. *tenellum. R.*

Culms ascending. *Leaves* long. *Panicles* oblong, very ramous. *Flowers* solitary, remote; second valvelets of the calyces recurved, and pointed. *Corol*, three-valved. *Seed* oval, smooth, five-nerved.

Grows on pasture ground, borders of cultivated lands, &c. I. 307

Culms many, branchy, near the ground prostrate, rooting at the joints, the rest ascending; from one to two feet high, and as thick as a sparrow's quill. *Leaves* soft with white hairs. *Panicles* oblong, generally as long as the rest of the plant, thin, composed of expanding, capillary, ramous branches. *Flowers* remote, oval, small. *Calyx*, the *glumes* striated, otherwise smooth. *Corol*, with a third neuter valve. *Seed* oblong, smooth, light-brown, five-streaked.

42. P. *serrulatum. R.*

Culms erect, from two to four feet high. *Leaves* sword-shaped, with serrulate margins. *Panicle*, spiked valvelets of the calyces sharp-pointed. *Seed* smooth, oblong.

A large erect, coarse species; a native of moist vallies.

Culms erect, ramous, from two to four feet high. *Leaves* somewhat cordate at the base, from thence tapering to a point, margins ciliate; *sheaths* as long or longer than the joints, smooth. *Panicle* erect, linear, composed of erect, linear, ramous ramifications, which stand somewhat remote, particularly below, so that the panicle appears to be a compound interrupted spike. *Flowers* lanceolate. *Calyx*, glumes lanceolate, very acute, the two inner ones somewhat hispid on the back. *Corol* single, hermaphrodite. *Seed* oblong, smooth, white.

43. P. *paludosum. R.*

Culms erect, from two to three feet high. *Panicle* erect, ovate, thin; *ramifications* few, three-sided, with sharp hispid angles; pedicel two-flowered; valvelets of the calyces cuspidate. *Corol* three-valved. *Seed* oblong, smooth.

Beng. Boruti, and Kulus-nar.

Teling. Soda.

It grows generally in sweet water amongst the Circar mountains.

Culms erect, from two to three feet high, swelled under the water, and there emitting roots from the joints. *Leaves* erect, acute, retrorso-hispid; *sheaths* longer than the joints, with a thick bearded mouth. *Panicle* oval, diffuse, thin, composed of scattered, sub-alternate, ramous branches; all nearly triangular, the angles sharp, and armed with fine points. *Flowers* oblong, pointed, in pairs on a common pedicel with unequal partial pedicels. *Calyx*, exterior valve short, broad, involving the bottoms of the others. *Corol*, with a small neuter glume, always without stamens. *Seed* oblong, smooth, brown. I. 308

Obs. This grass is of a coarse nature; cattle are not therefore fond of it. When it grows on dry ground, the grass is much smaller, but the panicle larger.

44. P. *uliginosum. R.*

Culms erect, from two to four feet high. *Panicle* thin; *ramifications* four-sided, smooth; *flowers* polygamous, solitary. *Seed* oblong, smooth.

Beng. Barunda.

Teling. Gundru.

A native of the moist borders of rice fields, in wet ground.

Root fibrous, white. *Culms* many, ramous; below resting on the ground and rooting; above erect, a little compressed, smooth; from two to four feet high. *Leaves* short and sharp,

Page Carey Ed. inside a little downy: *sheaths* shorter than the joints: mouths bearded. In [illegible] the are surrounded on the inside with hair. Here the ramifications are compressed, and somewhat four-sided, there triangular, and hispid. *Panicle* more contracted than in *paludosum*. *Calyx* the same. *Corol*, with a complete male floret. *Seed* oblong, smooth.

Obs. To distinguish it from P. *paludosum*, attention must be paid to the leaves, ramifications of the panicle, and male florets.

45. P. *sarmentosum*. *R.*

I. 309 Perennial, inane, hairy, sarmentose, with sub-erect, floriferous shoots from the joints. *Panicle* patent. *Flowers* solitary; *calyces* smooth and obtuse, containing one hermaphrodite and one neuter floret.

A native of Sumatra; and from thence introduced by Dr. Charles Campbell into the Botanic garden in 1804, where it grows luxuriantly, and blossoms throughout the year.

Culms round, sarmentose, and of great length, inane, with nearly erect, frequently ramous, floriferous shoots of about two or three feet in height rising from the joints: every part clothed with much soft hairy pubescence, particularly the runners. *Leaves* ensiform, soon becoming reflex, margins hispid, length from six to twelve inches, from half to three quarters of an inch in breadth at the broadest part. *Sheaths* rather longer than the joints. *Panicle* terminal, ovate; composed of many, single, alternate, patent, compound, smooth branches. *Flowers* very numerous, awnless, smooth, solitary, pedicelled. *Valves* of the calyx three, obtuse, slightly marked with green nerves, the exterior one long, containing a two-valved hermaphrodite flower, and a small neuter one.

46. P. *miliare*. *Lamarck*.

Culms erect, ramous, from two to three feet high, smooth. *Panicle* thin; *flowers* paired on a common pedicel, with unequal partial pedicels; *corol* three-valved; *seed* ovate, smooth, five-streaked.

Teling. Nella-shama. Nella-shamaloo, the grain.

This species I have found only in a cultivated state, it is one of the sorts of dry or small grain which is generally cultivated on an elevated, light, rich soil.

Culms, many from the same seed, erect, branchy, round, smooth, from two to three feet high. *Leaves* smooth. *Panicle* oblong, beautifully bowing with the weight of the grain; branches alternate, ramous; capillary, angular, hispid. *Flowers* oval, paired upon a common pedicel, with unequal partial pedicels. *Calyces*, *glumes* smooth, striated lengthways with nerves. *Corol*, accompanied by a neuter valve. *Seed* oval, striated, smooth, shining brown.

I. 310 *Obs.* The seed is an article of diet with those Hindoos who inhabit the higher lands. Cattle are fond of the straw.

47. P. *miliaceum*. *Linn. sp. pl. ed. Willd.* i. 348.

Culms erect, ramous, from two to four feet high; the whole plant very hairy. *Panicle* oblong; glumes of the calyces cuspidate. *Corol* three-valved; adventitious valve two-toothed. *Seed* oval, smooth, five-streaked.

Sans. Vreehi-heda, *Unoo*.

Hind. and *Beng.* Cheena.

Teling. Worga; Worglo, the grain.

This is another of the cultivated *cerealia*: the same soil suits it as is proper for the last described species. Time of culture immediately after the rains.

Culms many from the same seed, erect, ramous, very hairy; from two to four feet high. *Leaves* large, with long sheaths, which involve most part of the culms, every part covered with much white hair. *Panicle* as in the former, only here and there a few hairy. *Calyx* all the three glumes are much pointed. *Corol* the neuter valve is here emarginate. *Nectary* two, triangular, emarginate bodies embrace the germ laterally. *Seed* oval, mouth brownish, with smooth, coloured streaks lengthways, as in the last.

48. P. *tenue*. *R.*

Culms erect, ramous: from one to six feet high. *Panicle* thin, flowers paired on a common hairy pedicel, with unequal partial pedicels. *Corol* three-valved. *Seed* ovate, transversely waved.

This is a wild species, which grows amongst the Cirear mountains.

Culms erect, sometimes resting on the ground, and striking root there, ramous, smooth, from one to six feet high. *Leaves* large: upper-side hairy: edges armed with very sharp points.

I. 311 *Sheaths* shorter than the joints, hairy, with their mouths bearded. *Panicle* erect, till the seeds are ripe, then, as in the cultivated sorts last described, bowing from the weight of the grain, it is composed of alternate, compound, nearly secund racemes. *Rachis; common* from four to five-sided; *partial* three-sided, winding, and hairy. *Calyx*, glumes many nerved, otherwise smooth. *Corol*, the neuter valve is here present, and in luxuriant plants, the stamens also. *Seed* oval, transversely wrinkled, which distinguishes it from all the other panicled species.

49. P. *plicatum*. *R.*

Erect, herbaceous, harsh with stiff hairs. *Leaves* lanceolate, plicate. *Panicle* lanceolate, ramifications compound, flowers paired, polygamous.

Introduced into the Botanic garden, from the Island of Sumatra. Flowering time the beginning of the cold season.

Root perennial. *Culms* erect, or ascending, below as thick as a goose-quill, and then somewhat compressed: every part filled with pith. *Leaves* sub-bifarious, expanding, lanceolate, plicate, a little hairy; from six to twelve inches long, and from one to two broad. *Sheaths* about the length of the joints of the culms, armed with sharp, rigid hairs; mouth ciliate.

Panicle oblong, lax; lower ramifications rather remote, above approximate, and composed of unilateral short spikelets. *Flowers* solitary, paired, or threefold, when more than one they are on pedicels of unequal lengths; sometimes there is a single coloured bristle from the pedicels of the exterior flowers. *Calyx* three-valved, two-flowered, one of the flowers male, with a corol of one membranaceous glume; the other hermaphrodite, and having the usual two-valved corol. *Seed* oblong, rugose on the convex side. Page Carey Ed.

Obs. It is of too coarse a nature for cattle, but its foliage make it ornamental in the shrubbery, or flower-border.

50. P. *nervosum. R.*

Erect, from three to four feet high. *Leaves* lanceolate, plaited. *Sheaths* longer than the joints, with the mouths bearded. *Panicle* very thin, composed of long, simple, filiform, remote branches. *Flowers* generally single, with a neuter valve to the corol. J. 312

From Nepal Dr. Buchanan sent the seed to the Botanic garden, where the plants blossomed in October, just one year from the time the seed was sown.

Root perennial. *Culms* erect, slender, completely invested in the sheaths of the leaves, except from six to twelve inches below the panicle; height three or four feet. *Leaves* lanceolate, plaited, a little hairy, particularly near the base, from six to twelve inches long, and one and a half broad. *Sheaths* longer than the joints, a little hairy; mouths bearded. *Panicle* very thin, and composed of long, simple, filiform, drooping branches. *Spikelets* remote near the base, secund, bearing a few alternate, generally single flowers. *Calyx* three-valved, smooth, from three to seven-nerved. *Corol*, with a third neuter valve, but no stamens.

Obs. In foliage this agrees very exactly with my *Panicum plicatum*, but differs widely in the panicle.

51. P. *costatum. R.*

Culms creeping. *Leaves* lanceolate, plaited, very hairy, as also their sheaths, which are shorter than the joints. *Panicle* composed of short expanding, secund, spiked-racemes. *Flowers* polygamous.

Introduced into the Botanic garden from the Mauritius, by Captain Tennant, in 1802.

Culms creeping, throwing out numerous strong roots from the joints; from three to six feet long. *Leaves* lanceolate, plaited, hairy; about six inches long, by one broad. *Sheaths* shorter than the joints, very hairy. *Panicle* oblong, smooth, composed of somewhat compound, secund, spiked-racemes, with here and there an arista-like coloured bristle. *Calyx* three-valved, smooth, from three to five-nerved. *Corol* three-valved, two-flowered; the exterior floret one-valved and male. *Seed* transversely rugose. I.

Obs. In the foliage this is perfectly like my P. *nervosum* and *plicatum*. 313

52. P. *montanum. R.*

Culms erect, smooth, from three to four feet high. *Leaves* lanceolate, unequally divided by the nerve. *Panicle* oblong; *ramifications* capillary, straight. *Corol* two-valved. *Seed* smooth, oval, three-nerved on the back.

A native of the Circar mountains.

Root fibrous, from a ligneous perennial head. *Culms* erect, smooth, of a firm woody texture, as thick as a crow's quill, and three to four feet high. *Leaves* lanceolate, large, beautifully striated lengthways, somewhat hairy, lower margins next the mouths of the sheath ciliate; the nerve divides the leaf unequally, which is an uncommon circumstance in grasses. *Panicle* linear, oblong, from twelve to eighteen inches long, composed of straight, suberect, capillary ramifications. *Flowers* small, oval, remote. *Calyx* as in the genus. *Corol* as in the family; this is one of the few instances of the want of a male or neuter floret. *Seed* smooth, brown, with three stripes.

PHLEUM. Schreb. gen. N. 128.

Calyx two-valved, sessile, linear, truncated, with a bicuspid tip. *Corol* inclosed.

1. P. *crinitum.*

Grows in tufts. *Culms* ascending. *Panicle* linear, crowded with innumerable soft, bearded ramifications; both glumes of the *calyx* awned and ciliate, and the large glume of the corol awned.

A native of Nepal, and of the northern part of India.

From the former country it was introduced into the Botanic garden by Dr. Buchanan; and from the latter by Col. Hardwicke. J.

Culms numerous from a single root, ascending, length from six to twelve inches, round, smooth, and involved in the sheaths of the leaves, which are longer than its joints. *Leaves* ensiform, from three to six inches long, smooth. *Panicle* linear, oblong, dense, exceedingly soft from the immense number of most delicate, pale coloured awns. *Flowers* minute and numerous. *Calyx; glume* one-flowered, two-valved; *valves* nearly equal, with a most delicate, long, soft arista from the apex; hairy, chiefly on the back, and membranaceous ciliate margins. *Corol* two-valved; valves obtuse, much shorter than the calyx, as in general a very minute awn issues from the apex of the larger valve. *Seed* smooth, oblong, but obtuse. 314

Obs. In the cold season of 1802-3, I reared the same grass from seed sent from England by A. B. Lambert, Esq.

MILIUM. Schreb. gen. N. 10.

Calyx. glume one-flowered, two-valved. *Corol* two-valved, less than the calyx.

1. M. *filiforme. R.*

Page Carey Ed.

Creeping smooth. *Leaves* short, with a stipulary process at the mouth of the sheath. *Racemes* two or three, terminal, erect. *Flowers* alternate, solitary, awnless.

Hind. Kanka juriya.

Grows on pasture ground, is a small, delicate species, has much the appearance of *Agrostis linearis.*

Culms creeping, except a small flower-bearing portion, which is erect, round, smooth; and from six to twelve inches high. *Leaves* small, smooth; mouths of the sheaths stipuled. *Racemes* two or three, terminal, sessile, erect, secund. *Rachis* membranaceous, a little waved. *Flowers* single, alternate, imbricated in two rows, awnless. *Calyx*, glumes nearly equal, membranaceous, a little hairy. *Corol*, valves rigid, smooth.

I. 315 2. M. *sanguinale. R.*

Culms sub-erect, smooth. *Racemes* sub-digitate; *flowers* three-fold, on unequal pedicels.

Panicum sanguinale. *Burm. Flor. Ind. t.* 10. *f. t.*

Beng. Chiri-chira.

A native of pasture ground.

Culms sometimes creeping near the base, the rest erect, smooth, and about a foot and a half high. *Leaves* long, narrow, smooth in every part. *Panicle* racemed, sub-erect. *Racemes* from four to eight, secund, erect, rachis three-sided. *Flowers* generally in threes, though sometimes in pairs or in fours, all have pedicels of unequal length. *Calyx* and *corol* as in the last species.

3. M. *ramosum. Linn. sp. pl. ed. Willd.* i. 361.

Smooth; *culms* sub-erect, from two to four feet high. *Panicle* six or eight, remote, with somewhat ramous branches. *Flowers* paired on common pedicels. *Calyces* pointed, and very hairy.

Found growing in large tufts, on moist, rich pasture ground.

Root creeping. *Culms* from one to four feet long, spreading near the base, and striking root at the joints that rest on the ground. *Leaves* smooth. *Panicle* oval, very thin, composed of a few, from four to eight-compound, spreading, secund, racemes. *Rachis* of the racemes three-sided. *Flowers* below, on a common pedicel, besides which each has its proper pedicel, but of unequal length; above single. *Calyx*, valves equal, pointed, and very hairy. *Corol*, the exterior valve ends in an awled point.

AGROSTIS. Schreb. gen. N. 111.

I. *Calyx*, glume one-flowered, two-valved. *Corol* two-valved, larger than the calyx.

316 1. A. *coromandeliana. Linn. sp. pl. ed. Willd.* i. 374. *Retz. Obs.* iv. *N.* 52.

Culms from four to eight inches high. *Panicle* verticelled; *ramification* simple, secund; *inner* valve of the calyx as long as the corol; *exterior* valve minute. *Seed* naked, obovate, rugose.

Teling. Yellika-tungoo-gadi.

A native of pasture ground.

Culms spreading near the base, then ascending, from four to eight inches long, mostly involved in the sheaths of the leaves. *Leaves* rather broad, waved and slightly ciliated; mouths of the sheath bearded. *Panicle* oblong; large for the size of the grass, composed of expanding, simple, verticelled, secund racemes. *Flowers* awnless, generally in pairs, unequally pedicelled. *Calyx, exterior* valve small, like that of the accessary valve in *Panicum. Inner* as large as the corol, and gaping with it when the seed ripens. *Seed*, it drops uncovered by the corol, leaving it and the calyx in their places; it is of an oblique oval form, brown, and transversely rugose.

2. A. *tenacissima. Linn. sp. pl. ed. Willd.* i. 374.

Smooth, creeping. *Leaves* minute. *Panicle* filiform; exterior valvelet of the calyx shorter than the corol.

Teling. Toema-gerika.

A small, rigid species; growing on old, poor, stiff, pasture ground, where it forms extensive plants of tenacious turf.

Culms ramous, creeping to a great extent, with from four to eight inches high of their flower-bearing extremities, erect, smooth, filiform, and very firm. *Leaves* very small, and smooth. *Panicle* erect, linear; *ramifications* and *flowers* adpressed, from one to two inches long. *Calyx*, exterior valve smaller than the interior. *Corol* as large and long as the inner valvelet of the calyx.

I. 317 3. A. *Matrella. Linn. sp. pl. ed. Willd.* i. 366.

Creeping. *Leaves* pungent. *Spikes* terminal, solitary, few-flowered.

A native of the barren sandy lands, near the sea on the coast of Coromandel.

4. A. *diandra. Linn. sp. pl. ed. Willd.* i. 371. *Retz. Obs.* v *N.* 37.

Smooth. *Culms* erect, from one to three feet high. *Panicle* linear, branchlets short, expanding; *flowers* paired, diandrous. *Calyx* scarcely half the length of the corol. *Seed* naked, obovate, rugose.

Beng. Bena-joni.

A native of moist pasture ground, in the vicinity of Calcutta.

Culms nearly erect, from one to three feet high, almost covered with the sheaths of the leaves. *Leaves* narrow, tapering to a fine point, smooth; mouths of the sheaths slightly bearded. *Panicle* linear-oblong, bowing a little, often a foot long, composed of expanding, alternate, compound, seemingly simple racemes. *Flowers* in pairs on a common peduncle,

but unequally pedicelled. *Calyx*, valves equal, scarcely half the length of the corol, smooth, membranaceous. *Stamens* two. *Seed* narrow-obcordate, dropping from the calyx and corol, brown, obtusely rugose. Page Carey Ed.

5. A. *maxima. R.*

Culms erect, from four to twelve feet high. *Panicle* ovate, expanding. *Calyces* minute, exterior valvelets of the corol fringed with long hairs. *Stamens* two.

This is the largest species I know; it is a native of hedges, &c. amongst the mountains.

Root ligneous, perennial. *Culms* erect, from four to twelve feet high, often as thick as the little finger, round, and smooth, inside replete with a fibrous spongy substance. *Leaves* smooth, from one to two feet long; and from one to two inches broad at the base, tapering from thence to a fine point. *Panicles* erect, oval, or oblong, from one to two feet long, composed of alternate, ramous, filiform, expanding or bowing branches. *Calyx*, valves equal, four times shorter than the corol. *Corol*, exterior valve fringed round the margins, with long, soft, white hairs. *Stamens* two. I. 318

Obs. The leaves of this plant are much more like those employed by the Chinese to pack up various articles with, than any other I have yet seen.

HOLCUS. Schreb. gen. N. 1565.

Polygamous. *Calyx*, glume two-valved, one to three-flowered. *Corol*, glume two-valved, the hermaphrodite awned. *Stamina* three. *Styles* two.

1. H. *nervosus. R.*

Erect, hairy. *Panicle* oblong. *Glumes* three, and five-nerved, cuspidate, two-flowered. *Flowers* both sessile, one hermaphrodite and awned; the other male and awnless.

A native of Coromandel.

Culms erect, ramous; long, wiry roots issuing from the lower joints. *Leaves* and their sheaths papillose, hairy. *Panicles* oblong, smooth. *Ramifications* alternate, simple. *Flowers* paired; one sessile, the other pedicelled. *Calyces* two-flowered, three to five-nerved, smooth, straight, cuspidate, longer than the flowers. *Corol* in both two-valved, the exterior floret male, large, and awnless, the inner minute, hermaphrodite, and awned. *Stamens* three. *Styles* two, in the hermaphrodite.

2. H. *ciliatus. R.*

Erect, hairy, panicle linear, hirsute. *Glumes* papillose, ciliate, two-flowered, both flowers sessile, one hermaphrodite and awned, the other male and awnless.

A native of Coromandel. I.

Whole plant about a foot high, erect. The *culms* with bearded joints. *Leaves* rather large, hirsutely papillose, as are also their sheaths. *Panicles* linear, shaggy with the numerous hairs of the *calyces*. *Calyx* two-valved, two-flowered; *valves* nearly equal, considerably longer than the flower, backs covered with little warts, from each of which arises a very conspicuous hair; *apices* cuspidate, and recurvate. *Corol* two-valved in both. *Exterior* floret rather larger, male or male hermaphrodite, and awnless; *inner* hermaphrodite and awned. *Stamina* three. *Styles* two in the hermaphrodite, in the male hermaphrodite the rudiments of two, but no germ. 319

ISCHÆMUM. Schreb. gen. N. 1569.

Polygamous. *Calyx* two-valved, two-flowered. *Corols* two-valved.

1. I. *aristatum. Linn. sp. pl. ed. Willd.* iv. 939.

Annual. *Leaves* sword-shaped, ciliate and hairy, with coloured margins. *Spikes* paired, secund. All the calyces two-flowered; *valves* striated; *exterior* of the sessile flower with a bifid membranaceous border round the anterior margin; an awned hermaphrodite floret in each flower.

A native of newly formed pasture land, in various parts of India, appearing about the close of the rains. It is a scarce grass, and does not appear to be fit for cattle.

Culms at the base resting on the ground and there rooting, ramous; erect portions from one to two feet long, slender, with woolly joints. *Leaves* length of the spikes, ensiform, broadest at the base and there cordate, hairy, ciliate, with hispid, coloured margins. *Spikes* two, terminal, secund, from one to two inches long. *Rachis* flexuose, jointed, three-sided, with the angles very hairy. *Flowers* in pairs, one sessile, the other pedicelled. *Pedicel* three-sided, and ciliate. *Calyx* of the sessile flowers two-valved, two-flowered; one floret hermaphrodite, the other male. *Exterior valves* striated, with its anterior margins and apex enlarged with a broad, membranaceous, bifid border; *inner valve* boat-shaped, keeled, ciliate, and sub-aristate, one floret male, the other hermaphrodite. *Corol, glumes* of each floret two-valved; the exterior one of the hermaphrodite floret bifid, with a long arista in the fork. *Calyx* of the pedicelled flower two-valved, two-flowered; *valvelets* equal, boat-shaped, keeled, ciliate, and sub-aristate; one floret male, the other hermaphrodite. *Corol*, as in the sessile flowers, and also awned in the same manner. I. 320

Obs. I am not certain that this is the original I. *aristatum* of Linnæus and Retzius.

2. I. *rugosum. Linn. sp. pl. ed. Willd.* iv. 940.

Erect, ramous. *Leaves* lanceolate; *spikes* paired, both flowers awned; *calyces* oblique, obtuse, hard, and transversely rugose.

Is generally found growing among rice, and is so much like it, the inflorescence excepted, that they are not, till in flower, to be distinguished. *Leaves* large, smooth; *mouths* of

Page Carey Ed. the sheaths crowned with a long, two-parted ligula. *Spikes* terminal, and from the exterior axills paired, erect, from two to three inches long. *Rachis* jointed. *Flowers* in pairs; one sessile, the other on a short, thick, angular, clubbed pedicel.

Sessile Flower. *Calyx* two-valved; *valvelets* in size nearly equal, the exterior one rugose, and very hard; one of the florets hermaphrodite, the other male, each with two membranaceous valves; the inner valve of the hermaphrodite flower has a long twisted awn issuing from the middle of its back.

Pedicelled Flower smaller. *Calyx* as in the other, but containing two male flowers one of which is also awned.

3. I. *semisagittatum. R.*

I. 321 Annual. *Leaves* ovate-lanceolate, semisagittate. *Spikes* paired, secund, all the calyces two-flowered, exterior valvelets transversely rugose; hermaphrodite floret of the sessile flower awned.

A native of newly formed pasture land in Bengal. It is a rare grass, appearing about the close of the rains.

Culms ramous, resting on the ground near the base, and there striking root at the joints, the sub-erect portion from twelve to eighteen inches, very delicate, firm, and smooth. *Leaves* short, broad-ensiform, or rather ovate-lanceolate, with a cordate base, and one of the lobes generally projecting considerably beyond the culm; margins slightly hispid, length one and a half or two inches. *Spikes* two, terminal, sub-secund, an inch and a half long. *Rachis* jointed, scarcely flexuose, three-sided; *angles* hairy. *Flowers* in pairs, one sessile, the other sub-sessile, both with their base bearded. *Calyces* of both flowers almost alike, two-flowered, two-valved; *exterior* valvelets obliquely-lanceolate and rather obtuse, the lower gibbous half transversely rugose, as in I. *rugosum*, upper portions striated lengthways; margins of the lower rugose portion notched; of the upper striated part ciliate; *inner* boat-shaped in both, one floret is male, the other hermaphrodite. *Corol; glumes* of each floret two-valved; the exterior valvelet of the hermaphrodite floret bifid, with a long arista in the fork.

Obs. It ought to be compared with I. *barbatum.*

4. I. *conjugatum. R.*

Partly creeping. *Leaves* short, acute, with broad cordate base. *Spikes* conjugate, seemingly united. *Flowers* paired, with the exterior valves of both calyces even, and very woolly; the sessile one hermaphrodite, awned.

A native of pasture land in the vicinity of Calcutta, appearing in the cool season.

Culms very ramous, creeping near the base, filiform, smooth, length from six to eighteen inches, generally purplish. *Leaves* with broad cordate base, from thence tapering to a fine point, sheaths smooth. *Spikes* conjugate on a slender, clavate, purple peduncle; united at the base, at all times continuing close as if one. *Rachis* very hairy, and jointed. *Flowers* from four to eight pairs on each spike, one sessile, the other sub-sessile. *Calyces* nearly alike, two-valved, two-flowered; the exterior valves even, acute, and uncommonly woolly on the back; the inner boat-shaped, acute, and smooth. In each, one of the florets is hermaphrodite, the other male. *Corols* all two-valved, hyaline; the inner valve of the hermaphrodite floret in the sessile flower bifid and awned. *Stamina* three. *Styles* two.

I. 322

5. I. *geniculatum. R.*

Stems geniculate, creeping, smooth. *Leaves* ensiform. *Spikes* conjugate, apparently only one. *Calyces* two-flowered, smooth, and crested; with the hermaphrodite flowers awned.

A small species, a native of Bengal. Flowering time the cool season.

Culms polished, from one to two feet long, very ramous, diffuse, geniculate; *joints* large, emitting smooth, very brown roots. *Leaves* small, ensiform, smooth; *sheath* smooth, and shorter than the polished joints of the culm. *Spikes* terminal, conjugate, generally so close as to seem only one, smooth, about an inch long. *Rachis* jointed, flexuose; *angles* sharp, and sometimes hairy. *Flowers* paired, one sessile, one peduncled. *Calyces*, both two-flowered; one hermaphrodite and awned, the other male and awnless. *Exterior* valves of the sessile flower enlarged with two, hard, serrulate crests, one on each side of the apex; *inner* mucronate, with a similar crest on the back, under the apex; of the *pedicelled flower* both are boat-shaped, mucronate, or sub-aristate, and the exterior one crested on the back under the apex; all are smooth and marked with green, longitudinal veins. *Corols* two-valved; the exterior valve of the hermaphrodite flowers bifid and awned.

I. 323

6. I. *tenellum. R.*

Creeping near the base. *Leaves* linear. *Spikes* paired. *Exterior* valve of the sessile flower truncate, the rest cuspidate, hermaphrodite flower alone awned.

A weak straggling species.

Culms weak, creeping and ramous towards the base; towards the heads erect; the thickness of a pigeon's quill; joints bearded. *Leaves* a little hairy near the base, mouths of the sheaths ligulate, and hairy. *Spikes* paired, &c. as in the last species. *Flowers* paired, &c. *Calyx* of the sessile flowers two-valved, two-flowered; *exterior* valve retuse and bordered; *inner* valve ending in an awled point. *Flowers* two, one hermaphrodite with a two-valved corol, the exterior of which ends in an arista, the other is male with an awnless two-valved corol. *Calyx*, of the pedicelled flowers both valves alike, and ending in an awled point; it contains a single flower, which is sometimes hermaphrodite, and sometimes male, with the rudiment only of the second flower.

7. I. *repens. R.*

Creeping. *Leaves* short and acute. *Spikes* paired. *Flowers* all polygamous and awnless; *glumes* of the calyces smooth and cuspidate. *Rachis* smooth.

A native of Pulo Pinang.

Page Carey Ed.

Culms creeping, flexuose, smooth, from one to two feet long. *Leaves* bifarious, sword-shaped, short, rigid. *Sheaths* as long as the joints, a little hairy, with a stipulary process at the mouth. *Spikes* terminal, paired, uniting a little above what seems to be their base. *Rachis* jointed, three-sided, smooth. *Flowers* about six pair, one of each pair sessile, the other peduncled, both the pedicelled and sessile one consisting of a two-flowered, two-valved, rigid, acute, smooth calyx. *Flowers* polygamous, one hermaphrodite, the other male, both awnless, each floret having a corol of two acute valves.

I. 324

8. I. *cuspidatum. R.*

Floating on sweet water with a portion of the tops of the plant emerging. *Leaves* linear, smooth. *Spikes* three-fold. *Exterior* valve of the calyces with a long, waved, ensiform point; all the corollets two-valved, and awnless.

A native of Bengal, where it is found floating on pools of sweet water, and blossoming about the close of the rains in October.

Culms appear to be perennial, a fathom or two long, jointed, as thick as the little finger, floating. *Leaves* linear, acute, from one to two feet long, margins backwardly hispid, in other respects smooth. *Spikes* terminal, three in the only plant that has yet blossomed in this garden, each about six or eight inches long, a little compressed; when the flowers expand about noon they appear like Chevaux de frise, at other times they appear smooth. *Flowers* in pairs, one sessile, containing one hermaphrodite, and one male floret, the other pedicelled and neuter, or with two male florets. *Calyx* two-valved; *exterior* valve rigid, with hispid margins and long, flat, waved, hispid-margined, ensiform points; *inner* valve boat-shaped with a flat hispid keel. *Corols* of each floret two-valved.

APLUDA.

Polygamous. *Involucre* one-valved, two-flowered, one sessile, the other pedicelled with a pedicelled neuter rudiment. *Calyces* two-flowered, the sessile one polygamous, the pedicelled one the same, or with male only. *Corols* two-valved.

1. A. *aristata. Linn. sp. pl. ed. Willd.* iv. 938.

Perennial, creeping, or scandent. *Leaves* lanceolate. Hermaphrodite flower awned.

Beng. Goroma.

Teling. Pootstrangali.

Is commonly found in hedges, under the shade of trees and such like places.

I. 325

Culms creeping, or climbing, as thick as a crow's quill, jointed, coloured, the lower part naked, inwardly spongy; from the joints spring erect, ramous, flower-bearing branches of from one to seven feet high. *Leaves* very elegant, somewhat bifarious, sheathing, petioled, linear-lanceolate, backwardly hispid; from six to eighteen inches long; *sheaths* smooth, mouths short-stipuled. *Panicles* terminal, and from the exterior axills, or, the whole may be considered, as one linear leafy panicle. *Bractes* three-flowered, boat-shaped, with an awned point. *Flowers*, one of the three sessile, or rather sitting on a globular receptacle, consisting of a common, two-flowered calyx, one of which is sessile, awned, and hermaphrodite; the other sessile, male and awnless; just without the calyx on each side, there is a bent, compressed pedicel, one of these supports a common calyx, with two male, two-valved, awnless flowers, the other only the rudiments of one or more florets.

2. A. *geniculata. R.*

Perennial, creeping, or scandent, intricately geniculate. *Leaves* lanceolar. In each calyx one heramphrodite, and one male flower, all awnless.

Found on the banks of the Ganges in flower during the latter part of the rains and the cool season.

Culms creeping, or climbing amongst bushes, reeds, &c. to an extent of many feet, smooth, and slender, bent at angles about a span distance at the swelled joints, emitting numerous wiry roots, filled with spongy pith, the thickest about the size of a crow's quill. *Leaves* linear lanceolate, and smooth, but much smaller than in A. *aristata. Sheaths* shorter than the joints. *Ligula* lacerate. *Panicles* terminal, composed of numerous slender branchlets of distinct fascicles of flowers, each fascicle containing many short-pedicelled, three-flowered, boat-shaped, cuspidate, smooth, bractes or involucres. *Flowers* one of the three sessile, containing one hermaphrodite, and one male floret; the other two elevated or broad sulcate; proper pedicels, one minute and abortive, the other polygamous as in the sessile flower. *Calyces* of both the sessile and pedicelled flowers two-valved, two-flowered. *Corol* in all of them two-valved; *valves* unequal, exterior one thin and transparent.

I. 326

Obs. The accurate Gærtner, *Carp. vol.* ii. *p.* 466. *t.* 175. gives to the sessile flower of A. *mutica*, one hermaphrodite, and one female floret, and to the pedicelled one two male ones, consequently this must be different, and a second awnless species.

AIRA. Schreb. gen. N. 112.

Calyx two-valved, two-flowered, without the rudiment of a third.

A. *filiformis. Kön. Mss.*

Smooth, erect, one foot high. *Leaves* ensiform. *Panicles* oblong, compound, of simple, linear, secund racemes.

A native of pasture ground.

Culms erect, mostly naked, round, smooth, about a foot high. *Leaves* small, smooth; *mouths* of the sheaths [illegible] by a membranaceous, [illegible] process. *Panicle* erect, thin, oblong,

Page Carey Ed. composed of alternate, simple, one-ranked, filiform, expanding racemes. *Flowers* in two row *Calyx* two-flowered, large.

MELICA. Schreb. gen. N. 113.

Calyx two-valved, two-flowered, with the rudiment of a third.

1. M. *digitata. R.*

Culms from four to five feet high. *Spikes* terminal, expanding, mostly five-fold. *Caly*
I. one-flowered; outer valvelets of the corol and rudiment awned.
327 A large beautiful species, and native of hedges, thickets, &c.

Culms near the base procumbent, but when supported by bushes erect and often from fou to five feet high. *Leaves* upperside somewhat hairy; *mouths* of the sheaths bearded. *Spik* four to five, digitate, secund, spreading, filiform, from six to nine inches long, hairy at th base. *Rachis* three-sided. *Flowers* in two rows, sessile, awned. *Calyx* one-flowered; *glume* unequal, the interior being three or four times longer than the exterior, and short-awned *Corol*, valves unequal, the largest has a long awn issuing just below its apex on the outside *Corpuscle*, or neuter floret pedicelled, and awned.

2. M. *refracta. R.*

Perennial, ascending. *Leaves* lanceolate. *Panicle* ovate, with the ramifications refract ed. *Petals* bearded, with stiff refracted bristles.

A native of the Moluccas, and from thence introduced amongst other plants, into th Botanic garden, where it blossoms during the cold season.

Root perennial. *Culms* ascending, from one to three feet long, round and smooth. *Leave* lanceolate, smooth; *sheaths* smooth, scarcely bearded at the mouths. *Panicle* terminal, ovate *ramifications* somewhat compound, and refracted like the drooping branches of some species o Pinus. *Calyx* smooth, two-valved, two-flowered, with an abortive third, or the rudiment o one. *Corol*, exterior glumes, chiefly of the second flower, bearded with refracted, sharp, stif bristles which fix to every thing that touches them.

3. M. *diandra. R.*

Smooth. *Culms* from two to four feet high. *Leaves* lanceolate. *Panicle* of long, simple, expanding racemes; *flowers* awnless, diandrous.

Poa *malabarica. Linn. sp. pl. ed. Willd.* i. 394.

I. A native of mountains on the Coromandel coast.
328 *Culms* ascending, from two to four feet high, firm, smooth, about as thick as a fine quill. *Leaves* bifarious, lanceolate, striated, smooth; *margins* waved, unequally divided by the nerves, about an inch and a half broad, and six inches long; *mouth* of the sheaths projecting above in a membranaceous process. *Panicles* large, thin, oblong, bowing a little, composed of sub-alternate, simple, spreading racemes. *Flowers* awnless. *Calyx* two-flowered, with the characteristic corpuscle, which is also here pedicelled, but awnless. *Corol*, exterior valve of the inner one has its margins and keel ciliate. *Stamens* two.

4. M. *latifolia. R.*

Perennial; *culms* erect, simple, from four to eight feet high. *Leaves* lanceolate. *Panicles* large and open, with alternate, compound drooping branches.

A native of the Garrow hills, from thence it was brought to the Botanic garden, by Mr. Robert Kyd, where it blossoms in March, at which period and indeed at all times it is one of the most elegant plants in the whole order.

Stems very numerous from the same root, erect, straight, and always without branches, more or less invested in the sheaths of the leaves; very smooth, texture remarkably hard, and filled with firm pith, generally about as thick as a goose-quill, and when in flower from six to eight feet high. *Leaves* sessile on their sheaths, lanceolate, smooth; from six to twenty inches long, and from one to four broad. They are much like the leaves employed by the Chinese to put between the boxes and lead canisters in which their teas are packed. *Seed* ventricose-oval, smooth, both ends rather pointed.

CHLORIS.

I. Polygamous. *Calyx* two-valved, from two to six-flowered: hermaphrodite flowers sessile; 329 male, or neuter ones pedicelled. *Corol* of the hermaphrodite flower two-valved; of the male, or neuter one-valved, all of them awned.

1. C. *tenella. R.*

Spikes solitary; *spikelets* with three or four hermaphrodite awned florets, and a neuter rudiment.

A native of the Peninsula of India.

Culms delicate, erect, smooth, about a foot high. *Leaves* rather large in proportion to the rest of the plant, smooth, and soft. *Spikes* solitary, secund, scarcely two inches long. *Spikelets* alternate, and alternately pointing two ways. *Flowers* of the spikelets, or to each calyx, three, four, or five, all hermaphrodite, (at least in the rather imperfect state in which I have found this rare species) except the innermost one which is a one-valved corpuscle or rudiment, as in *Melica*. *Calyx* from three to five-flowered, two-valved; *valvelets* unequal, broad lanceolate, smooth, acute, permanent. *Corol* of the hermaphrodite two-valved; exterior *valvelets* obcordate, enerulate, awned; *margins* smooth, but with three hairy nerves on the back and sides; *interior* oblong, with edges ciliate and always awnless.

2. C. *montana. R.*

Spikes digitate, secund, united at the base; *hermaphrodite* flower ciliate, and awned; *neuter* of three awnless valves. Page Carey Ed.

This is a native of mountainous tracts only. It differs from C. *barbata* only in the following respects. 1*st*. The spikes are in number from four to six, and united into a common flower-bearing rachis near the base. 2*d*. The neuter floret has a third awned valve and the awns are all straw-coloured.

3. C. *barbata. Linn. sp. pl. ed. Willd.* iv. 926.

Spikes digitate, secund; *hermaphrodite* corol ciliate, and awned, neuter of two awned valves.

Andropogon *barbatum. Linn. Mant.* 302. 588.

Konda-pulla. *Rheed. Mal.* 12. *p.* 95. *t.* 51. I.

Grows in large tufts on pasture ground, &c. very common every where. 330

Culms, below creeping, and ramous, the joints perfectly smooth. *Leaves* near the base bifarious; *margins* near the base and mouths of the sheaths ciliate. *Spikes* terminal, from six to twelve, sessile, secund, expanding, from one to two inches long. *Rachis* striated, not hairy, nor jointed. *Flowers* pedicelled, alternate, in two rows on the outside of the spikes. *Calyx* two-flowered, two-valved, membranaceous and awnless. The lower flower is sessile and hermaphrodite, its corol consists of two unequal ciliate valves, the base of which is surrounded with hairs, the exterior one ending in a long, coloured awn. The other floret I have always found neuter; it stands on a short pedicel and consists of two obcordate, awned valvelets; *awn* and *margin* of the valvelets coloured.

Obs. Cattle eat it till in flower; after which I never saw any animal touch it.

4. C. *polystachya. R.*

Spikes from ten to twenty, fascicled. Exterior glume of the hermaphrodite flower with ciliate margins; neuter florets two, with single smooth valves.

A native of the Peninsula of India.

Culms below procumbent for a little way, then erect, and about two feet high. *Leaves* as in other grasses, and smooth. *Spikes* about sixteen, in a terminal, sub-fastigiate umbelliform fascicle, secund with the alternate spikelets, or flowers pointing to opposite sides, from two to three inches long. *Calyx* of two, unequal, lanceolate, boat-shaped, smooth, permanent awnless valves, which contain one two-valved, hermaphrodite, awned flower; and two pedunculed, one-valved, awned, neuter florets. The exterior valvelet of the hermaphrodite flower has its margins ciliate.

POMMEREULLA. Schreb. gen. N. 97. I. 331

Calyx, glumes two-valved, from three to four-flowered; *valvelets* four-cleft, awned on the back.

P. *Corucopiae. Linn. sp. pl. ed. Willd.* i. 314. *Vahl. en. pl.* ii. 393. *R. Corom. pl.* ii. *N.* 131.

A very singular, small, rare grass; growing under bushes on dry uncultivated ground.

Root, culms, and *leaves,* as described by König, but mine has the spike compound and secund, the rest as he says, alba base abvolluta folia sub-spatheformi. *Spiculis* distichus, each having an involucre of two, lanceolate, acute, membranaceous valves. Within these two valves, is a short, clubbed, downy pedicel supporting the partial spikelets of four flowers, with their common calyx, it is joined to the involucre by an articulation and drops off most readily, particularly when dry, leaving the involucre attached to the rachis. *Calyx, corol,* and *stamens,* are as König describes them; but the germ is obcordate, and there are always two styles with feathery recurved stigmas. *Seed* as he describes it.

POA. Schreb. gen. N. 114.

Calyx two-valved, containing many flowers of two unequal valvelets disposed alternately on distichous spikelets.

1. P. *bifaria. Vahl. symbol.* ii. 19. *Linn. sp. pl. ed. Willd.* i. 401.

Smooth. *Culms* straight, from one to two feet high. *Spikes* terminal, straight, secund. *Spikelets* sessile, alternate, bifarious, the inferior from four to six-flowered, above many-flowered.

Teling. Wooda-tallum.

I believe König called it *Poa malabarica.*

Grows on mountains and other dry situations. I.

Culms straight, simple, from twelve to twenty-four inches high, a little compressed, 332
smooth. *Leaves* small, smooth. *Spikes* straight, secund, from four to eight inches long. *Spikelets* alternate, sessile, lanceolate, in two spreading rows, though issuing from one side of the common rachis. *Calyx* below, from four to six-flowered; above many-flowered.

2. P. *chinensis. Linn. sp. pl. ed. Willd.* i. 395.

Smooth, from two to four feet high. *Panicle* of many alternate, simple, expanding, secund ramifications. *Spikelets* alternate, short-pedicelled, from four to six-flowered.

Beng. Bura-*pini-nuti.*

A large, beautiful species, growing on the borders of water courses, and places where there is much moisture.

Culms ramous, creeping near the base, above expanding, from two to four feet high, every part smooth, and a little compressed. *Leaves* as in other grasses, smooth; *mouths* of the sheaths bearded. *Panicle* large, oval, composed of long, alternate, filiform, simple, ex-

Page Carey Ed. panding, secund branches. *Spikelets* alternate, from four to six-flowered, short-pedicelled, expanding in two rows from one side of the simple branches.

3. P. *procera. R.*

Smooth, erect, from three to five feet high. *Ligula* large; *ramifications* of the panicle simple; *spikelets* pedicelled, rather remote, linear, many-flowered.

Teling. Rewa.

Delights in a moist rich soil.

Culms nearly erect, branchy, from three to five feet high, round, smooth, much covered by the sheaths of the leaves. *Leaves* long, slender and smooth. *Sheaths* longer than the joints, with their mouths crowned with a long ragged membranaceous process. *Panicle* large, I. from nine to eighteen inches long, oblong, bowing a little, composed of numerous, long, fili- 333 form, expanding racemes, scattered round the common *rachis;* which is filiform, waved, three-sided, and hispid. *Spikelets* alternate, pedicelled, linear, remote, many-flowered.

4. P. *cynosuroides. Linn. sp. pl. ed. Willd.* i. 393.

Smooth, straight, from one to three feet high. *Leaves* long and acute. *Panicle* straight, sub-cylindrical; *ramifications* horizontal; *spikelets* depending, from six to twelve-flowered.

Uniola bipinnata. *Linn. sp. pl.* 104.

Sans. Koosha, Kootha, Durbha, Puvitrung.

Cusa or *Cusha. Asiat. Res.* iii. 255. and 490. and iv. 249.

Beng. Koosha.

Teling. Durbha, Dubha, or Durpa.

A strong coarse species, a native of dry barren ground.

Root creeping, perennial. *Culms* straight, rigid, round, smooth, from one to three feet high. *Leaves* numerous, very long, chiefly about the base of the culms, rigid margins hispid. *Panicle* erect, linear-oblong, often tending to a conical form, composed of many somewhat three-fold, verticelled, horizontal, short, rigid, secund ramifications. *Spikelets* many-flowered, depending, in two rows, from the under side of the ramifications. *Corol,* valves pointed, the inner one rather the largest.

Obs. It is employed by the brahmuns in their religious ceremonies. Cattle do not eat it. Can this be Gramen capillaceum? &c. *Pluck. Alm. p.* 176. *t.* 34. *Fig.* 2. *Cusa,* or *Cusha,* the Sanscrit name of this much venerated grass, was given to it at a very early period, by the Hindoo Philosophers, and believed, by Sir William Jones, to have been consecrated to the memory of *Cush,* one of the sons of *Ram.* See *Asiatic Researches, vol.* iii. *p.* 490. If so, we have here a very ancient precedent for the present very convenient practice of giving such arbitrary names to plants, and to their families.

I. 5. P. *ciliaris. Linn. sp. pl. ed. Willd.* i. 402.

334 Smooth, sub-erect, from one to two feet high. *Panicle* contracted, linear, with the lower ramifications remote. *Spikelets* from six to twelve-flowered; *inner* valvelets of the corol ciliate.

Delights in the same soil and situation with the last described species.

Culms near the base procumbent, above erect for one or two feet. *Leaves* as in the last. *Panicle* linear, from three to six inches long, the ramifications short, those of the lower part stand at some small distance, their insertions are not hairy. *Calyx* from six to twelve-flowered, not ciliate. *Corol,* only the inner valve ciliate. *Seed* as in the last.

6. P. *cylindrica. R.*

Erect, slender, from twelve to eighteen inches high. *Leaves* slender. *Panicle* cylindric, crowded with short, adpressed, ramous, alternate branches. *Spikelets* from six to twelve-flowered. *Flowers* diandrous, inner valve of the corol ciliate.

From Canton in China the seed was received into the Botanic garden, where the plants grow freely and blossom during the rains and the cool season.

7. P. *ciliata. R.*

Smooth, sub-erect, from one to two feet high. *Panicle* columnar; *spikelets* from six to twelve-flowered; *margins* of all the valvelets of the calyces and corols ciliate. *Seed* globular.

Is generally found on a poor dry soil.

Root perennial. *Culms* erect, rigid, smooth; from one to three feet high. *Leaves* smooth; mouth of the sheaths downy. *Panicle* columnar, from two to four inches long, branches thereof crowded, insertions hairy; *spikelets* from six to twelve-flowered. *Calyx,* margins ciliate. *Corol,* the margins of both valves much ciliate, the exterior one has three nerves and is pointed, the inner one two-nerved. *Seed* obovate, smooth, brown, dropping from I. the corol when ripe.

335 8. P. *interrupta. Kön. Mss.*

Erect, smooth, from one to three feet high; *ramifications* of the linear panicle short, and collected into remote fascicles. *Spikelets* from six to twelve-flowered. *Seed* obcordate.

Teling. Nakurnaral.

Grows about at the borders of rice fields.

Culms generally erect, from one and a half to three feet high, round, smooth. *Leaves* narrow, long, sharp, and smooth. *Panicles* erect, from six to twelve inches long, linear; *ramifications* sessile, nearly erect, remote, particularly those of the lower part, where they are often twice their length asunder; one, two, or more from the same point, which makes it appear verticelled. *Spikelets* minute, pedicelled, from six to twelve-flowered. *Corol,* valves smooth. *Seed* as in the last two species.

9. P. *nutans. Linn. sp. pl. ed. Willd.* i. 395. *Retz. Obs.* iv. 19.

Erect, smooth, from three to five feet high, panicles contracted; *ramifications* adpressed,

fascicled, and approximated. *Spikelets* from eight to fourteen-flowered. *Seed* oblong. Page Carey Ed.

Teling. Urenka.

Delights in a rich, moist soil, such as the banks of water-courses, borders of rice fields, &c.

Culms erect, from three to five feet high, generally simple, round, smooth. *Leaves* narrow, long, sharp, and smooth. *Panicle* linear, from one to two feet long; *ramifications* filiform, peduncled, adpressed, one, two, or more from nearly the same place, but seldom so far asunder as their own length. *Spikelets* pedicelled, from eight to fourteen-flowered. *Calyx* and *corol* smooth. *Seed* oblong, smooth, brown.

Obs. The best mark to distinguish it from the last species is the form of the seed which in that is obovate, in this oblong. Cattle are not fond of any of these tall, erect, coarse species. I. 336

10. P. *diandra. R.*

Erect, smooth. *Leaves* long, fine-pointed; *panicle* linear, half the length of the whole plant; *ramifications* scattered, compound, expanding, smooth. *Spikelets* from four to eight-flowered. *Flowers* diandrous.

A native of Bengal, where it blossoms during the cold season.

Culms erect, growing in tufts, with few branches, smooth; height of the whole plant in a good soil, from three to six feet. *Leaves* from one to two feet long, smooth in every part, tapering to a long fine point. *Panicle* linear, half the length of the whole plant; *ramifications* thereof scattered, expanding, smooth, compound, from two to three inches long. *Spikelets* lanceolate, small, smooth, from four to eight-flowered. *Corol* with both valves smooth, and rather obtuse. *Stamens* two. *Anthers* purple.

11. P. *viscosa. Linn. sp. pl. ed. Willd.* i. 398. *Retz. Obs.* iv. *p.* 20.

Culms ascending, from nine to eighteen inches high, clammy. *Panicle* linear-oblong; *ramifications* verticelled, short, spreading; *spikelets* from three to twelve-flowered; inner glumes of the corol ciliate.

This species grows in tufts on dry pasture ground.

Culms numerous, spreading, with their extremities ascending, ramous, from nine to eighteen inches long. *Leaves* small, margins involute; *sheaths* shorter than the joints, with their mouth surrounded with long, slender, white hair. *Panicles* linear-oblong, from two to four inches long, composed of short, sub-verticelled, sessile, expanding ramifications. *Calyx* from three to four-flowered. *Corol,* inner valve ciliate.

Obs. Every part of the plant is covered with tenacious gluten. I. 337

12. P. *tenella. Linn. sp. pl. ed. Willd.* i. 395.

Erect, smooth, from one to two feet high. *Panicle* linear-oblong, verticelled. *Spikelets* pedicelled, from four to six-flowered, smooth.

A native of pasture ground.

Culms erect, round, smooth, from one to two feet high. *Leaves* smooth, *mouth* of the sheaths much bearded. *Panicles* linear-oblong, composed of verticelled, filiform, expanding, ramous branches, having always at their insertions and sub-divisions a few fine, long hairs. *Spikelets* pedicelled, from four to six-flowered. *Calyx* and *corol* smooth. *Seed* oval, brown, smooth, falling from the corol when ripe, as do all the other species of this genus that I have yet seen.

Obs. The anthers shine through the valves, as in P. *punctata,* and indeed in most, if not all the *Poas.*

13. P. *plumosa. Linn. sp. pl. ed. Willd.* i. 403. *Retz. Obs.* iv. 20.

Sub-erect, smooth. *Panicle* ovate-oblong; *ramifications* scattered, horizontal; *insertions* hairy; ramuli depending. *Spikelets* pedicelled, from four to six-flowered; *inner* valvelets of the corols ciliate.

Tsjama-pullu. *Rheed. Mal.* xii. *p.* 75. *t.* 41.

Gramen fumi. *Rumph. Amb.* vi. *p.* 10. *t.* 4. *f.* 3.

Is found growing in tufts on pasture ground.

Culms filiform, many, ramous, spreading a little at the base, above erect, from one to two feet high, round, smooth. *Leaves, mouths* and *margins* of the sheaths fringed, with long delicate white hairs. *Panicle* oblong, composed of many capillary, alternate, horizontal, ramous branches, their insertions and sub-divisions are fringed with a few fine, white hairs. *Spikelets* minute, pedicelled, depending, from four to six-flowered. *Calyx* smooth. *Corol,* inner valve fringed with hairs in the back. *Seed* oblong, brown, smooth. I. 338

14. P. *punctata. Linn. sp. pl. ed. Willd.* i. 395.

Erect, smooth, from six to eighteen inches high. *Panicle* oblong; *ramifications* simple, expanding, lower ones verticelled. *Spikelets* from twelve to fourteen-flowered, smooth. *Seed* obliquely oblong.

This species grows in tufts on pasture ground.

Culms erect, generally simple, round, smooth; from six to eighteen inches high. *Leaves* small, smooth; *mouths* of the sheaths bearded. *Panicle* oblong; *ramifications* simple, expanding, the lower ones collected into one verticel; above alternate. *Spikelets* pedicelled, rather remote, linear, from twelve to fourteen-flowered. *Calyx* and *corol* smooth, thin, showing the unexpanded anthers and stigmas through them. *Seed* oblong, smooth, brown.

15. P. *elegans. R.*

Sub-erect, smooth, from one to three feet high. *Panicle* oblong, nodding ramifications solitary, ramous, adpressed. *Spikelets* from eight to twelve-flowered. *Seed* globular.

A very elegant, tall, delicate species, a native of moist pasture ground.

Page Carey Ed. *Culms* simple, at the base spreading for a few inches, the remaining part is erect, roun smooth; from one to three feet high. *Leaves* few and very small, smooth in every pa except the mouth of the sheaths, which are bearded. *Panicles* linear-oblong, nodding, co posed of erect, adpressed, distinct, somewhat remote ramification, each of which forms small, but similar panicle. *Partial rachis* with the angles hispid. *Spikelets* pedicelle linear, from eight to twelve-flowered, purplish. *Corol*, outer valve three-nerved. *Seed* gl bular, smooth, and brown.

16. P. *multiflora. R.*

Sub-erect, smooth, from six to eighteen inches high. *Panicle* longer than the rest I the plant, nodding. *Spikelets* crowded, from fifty to seventy-flowered. *Seed* globular.
339 Is found on dry elevated places.

Culms nearly erect, naked, except at the base, from six to twelve inches high, roun and smooth. *Leaves* one or two near the base of each culm, short; *mouths* of the sheaths little hairy. *Panicle* oblong, bowing; *ramifications* sub-sessile, short, filiform, simple, t lower collected into one or two remote branches; the upper ones alternate. *Spikelets* ped celled, very long, linear, from fifty to seventy-flowered. *Calyx* smooth, obtuse. *Corol* smoot outer valve three-nerved. *Seed* round, smooth, brown.

17. P. *unioloides. Linn. sp. pl. ed. Willd.* i. 393. *Retz. Obs.* v. 19.

Erect, smooth, from one to two feet high. *Panicle* ovate; *ramifications* short, simple below fascicled; above solitary, horizontal; *spikelets* long-pedicelled, from sixteen to twenty flowered. *Seed* oblong.

Beng. Konee.

A most elegant species, a native of dry elevated situations.

Culms, below ramous, with a small portion resting on the ground, the rest erect, and fro one to two feet high, round and smooth. *Leaves* few, small, and smooth; *mouths* of th sheaths bearded. *Panicles* half as long as the whole plant, erect, oblong, thin; *ramification* peduncled, filiform, disposed as in *multiflora*. *Spikelets* ovate, from sixteen to twenty-flow ered, generally of a bluish purple colour. *Corol*, outer valve three-nerved, as in P. *multiflo ra*. *Seed* oblong, smooth, brown.

18. P. *flexuosa. R.*

Sub-erect, flexuose, nodding, smooth, from eighteen to twenty-four inches high. *Pani cle* ovate, crowded; *ramifications* solitary, ramous, expanding, insertions hairy; *spikelets* twenty I. flowered. *Seed* globular.
340 A pretty large species, growing in tufts on old walls, so exactly resembling P. *unioloides* as to be easily mistaken for it. It has much the habit of *Briza Eragrostis*.

Culms sub-erect, winding, round, smooth; from one and a half to two feet high. *Leaves* much larger than in the last species, and the mouths of the sheaths more hairy. *Panicl* oval, very large, generally more than half the length of the whole plant, branches alternate, nearly horizontal, ramous, with a brown, hairy gland in the axill of each division of the pa nicle. *Spikelets* white, or pale green, lanceolate, large, about twenty-flowered. *Seed* globu lar, brown, and smooth.

19. P. *paniculata. R.*

Erect, smooth, from two to four feet high. *Leaves* long; mouths of their sheaths bearded *Panicle* oblong; *ramifications* most numerous, filiform; insertions hairy. *Spikelets* from fou to sixteen-flowered; *valvelets* of the calyces ciliate. *Seed* globular.

Culms sub-erect, round, and smooth; length from one to two feet high to the panicle, which is about the same length, making the whole height from three to four feet. *Leaves* large, mouths of the sheaths very hairy. *Panicle* oblong, very large, composed of numerous, ramous, filiform, expanding branches, their insertions and sub-divisions involved in fine, long, white hairs. *Spikelets* long pedicelled, linear, from four to sixteen-flowered. *Corol, outer* valve round at the apex, and three-nerved; *inner* one slightly ciliate on the back.

20. P. *gangetica. R.*

Grows in very dense tufts. *Panicle* thin. *Spikelets* linear, from thirty to forty-flowered.

A native of the banks of the Ganges, but scarce.

Culms numerous, and ramous, growing in crowded tufts, smooth in every part, genera I. length about a foot. *Leaves* few, small, and smooth. *Panicle* ovate, composed of a few 341 remote, alternate, sub-diverging branchlets, each supporting a number of heaped, linear, acu minate, smooth spikelets, of from twenty to fifty flowers each; as they advance from the apex the lower florets drop, leaving the zigzag rachis naked as they ripen. *Calyx* both valves smooth and obtuse. *Seed* oval, smooth, brown.

DACTYLIS. Schreb. gen. N. 117.

Calyx two-valved, compressed, one valvelet larger, keeled. *Seeds* few.

1. D. *lagopoides. Linn. sp. pl. ed. Willd.* i. 410. *Burm. Ind.* 28. *t.* 12. *f.* 2.

Creeping. *Leaves* rigid, with spinescent points. *Heads* globular. *Calyces* from six to eight-flowered, hairy, as are also the corols; *anthers* blue.

It is generally found growing on a salt sandy soil near the sea.

Culms creeping to a great extent, with from four to eight inches of the flower-bearing portions, erect, they are of a firm, ligneous texture, round and smooth, every part of the erect portions covered by the sheaths of the leaves. *Leaves* numerous, small, approximate, firm, acute, resembling thorns. *Head*, or *spike* terminal, short-pedicelled, globular, composed of many, closely crowded, sessile, roundish spikelets. *Calyx* from six to eight-flowered; *glumes*

equal, shorter than the flowers, obtuse and hairy. *Corol* two-valved, exterior striated, hairy, and obtuse; *inner* membranaceous, involving the stamens and pistillum. *Stamens* three. *Anthers* blue. Page Carey Ed.

2. D. *brevifolia. Linn. sp. pl. ed. Willd.* i. 410.

Creeping, ramous. *Leaves* short. *Heads* sub-globular, composed of three, secund spikes. *Calyces* acute, from six to twelve-flowered. *Corols* hairy, acute.

It is found on dry sandy ground at a small distance from the sea. I.

Culms spreading, ramous, creeping, with their flower-bearing extremities ascending, from six to twelve inches long. *Branches* generally opposite. *Leaves* short, with their margins ciliate. *Head* or *spike* terminal, long-pedunculed, globular, composed of two or three, sessile, secund, short spikes, which are again composed of two rows of alternate, from six to twelve-flowered, sessile, ovate-oblong spikelets. *Calyx*, from six to twelve-flowered, equal, acute, striated. *Corol*, outer valve keeled, acute, three-nerved, very hairy near the base, inner valve as in *Poa*, with its back ciliate. *Seed* oval, compressed, smooth, and brown; dropping from the corol when ripe. 342

Obs. Both these species are of a coarse nature.

The Linnæan definition of the genus does not accord well with the only two species I have met with in India. That of *Poa* agrees better with their essential character; and had not *Burman*, in his *Flora Indica*, made them both belong to this genus, I should certainly have considered them as species of *Poa*, though in their general habit they by no means agree with the elegant plants of that genus. When I had an opportunity I forgot to examine the seeds in a sufficiently exact manner. I suspect they have the aril of the following genus, because they have much of its general habit.

ELEUSINE. Gært. Carp. i. *p.* 7.*

Calyx two-valved, containing many flowers of two equal valvelets. *Seed* with a complete membranaceous aril.

1. E. *Coracana. Gært. Carp.* i. 8. *t.* 1.

Culms erect, from two to four feet high, compressed. *Leaves* bifarious. *Spikes* digitate, incurved. *Calyces* from three to six-flowered. *Seed* round. I.

Cynosurus Coracanus. *Linn. sp. pl. ed. Willd.* i. 415. 343

Tsjetti-pullu. *Rheed. Hort. Mal.* xii. *p.* 149. *t.* 78.

Panicum gramineum seu Naatsjoni. *Rumph. Amb.* v. *p.* 203. *t.* 76. *f.* 2.

It is called Nutchanee by Europeans on the Coromandel coast.

Ponassa, or early Soloo, is the Telinga name of the grain, and Sodee the name of the plant.

Beng. Murooa.

Raggee of the Coast Mahomedans.

This species is cultivated during the rains. I never saw it wild.

Culms erect, generally several from the same grain of seed; from two to four feet high, a little compressed, smooth. *Leaves* bifarious, large, smooth; *mouths* of the sheaths bearded. *Spikes*, from four to six, digitate, incurvate, secund, from one to three inches long, composed of two rows of sessile, from three to six-flowered spikelets. *Rachis* compressed, a little waved. *Calyx* from three to six-flowered, exterior glumes twice as long as the interior; both are keeled, obtuse, and membranaceous margined. *Corol*, valves nearly equal. *Seed* globular, dark brown, a little wrinkled, covered with a thin, pellucid, membranaceous aril.

2. E. *stricta. R.*

Culms erect, from two to five feet high, compressed. *Leaves* bifarious. *Spikes* digitate, straight. *Calyces* from three to six-flowered. *Seed* round.

Teling. Pedda, viz. great Soloo.

Hind. Raggee.

This is still more cultivated than the last, and differs from it only in having the spikes straight, being generally of a larger size, and more productive, the great weight of the seed, when full grown bends the spikes down into a horizontal direction. I.

There is a variety of this straight-spiked sort, which the Telinga farmers called *maddee rooba soloo*; it grows to a still larger size, with a greater number of straight spikes. 344

They all require a light rich soil, on which the water does not remain after heavy rains. The first or early sort does not require so rich a soil as the other two, it is sown earlier by which means the same ground yields two crops. From July to January inclusive they reckon on an increase of about one hundred and twenty fold if the soil and season are favourable.

The second sort requires a richer soil; it is sown later in the season; its increase is greater.

The third sort, *maddi ruba soloo*, requires a still richer soil; land fit for it is scarce, and the rent high. I am informed that it is nearly twice as much as that of land fit for the first sort. The increase of this kind is prodigious, five hundred fold, the farmers say, if the season and soil are favourable.

About twenty years ago, there came up accidentally amongst some rubbish in my garden a [illegible] of this plant, which upon cultivation, I found to be the produce of

* I adopt Gaertner's name on account of the aril, which envelopes the seed, and the total want of the involucre of Cynosurus in all the Indian species that I have yet met with.

Page Carey Ed. one seed, each had twenty-five culms, each of these culms had on an average two late branches, making in all seventy-five culms and branches, each produced upon an average spikes, (for they had from four to eight) in all four hundred and fifty spikes, each of th at a medium sixty spikelets, and each spikelet ripened on an average three or four seeds, to produce eighty-one thousand. I was myself particularly attentive in counting the above p duce because it was so astonishingly great.

In the Rajamundry Circar, where these observations were made, the soil is in gene rich, and the season favourable.

3. E. *ægyptica. R.*

Culms with a creeping base, from one to two feet high. *Spikes* four-fold, cruciate. *Ca ces* daggered, from three to four-flowered. *Seed* oval, somewhat three-sided, and transverse

I. rugose.

345 Cynosurus ægypticus. *Linn. sp. pl. ed. Willd.* i. 416.

Gramen vaccinum. *Rumph. Amb.* vi. *p.* 10. *t.* 4. *f.* 1.

Cavara-pullu. *Rheed. Mal.* xii. *p.* 131. *t.* 69.

Hind. Mak*ura*-jal*i*.

Grows in pasture ground, and by road sides, &c.

Culms, creeping near the base; the remaining part nearly erect for a foot, or a foot an a half, ramous, a little compressed, and smooth. *Leaves* fringed with hairs. *Spikes* term nal, from three to five, horizontal, secund, &c. as in E. *Caracana*. *Calyx* from three to fou flowered; *glumes* acute, particularly the exterior one which ends in a short awn. *Coro* outer valve very acute. *Seed* oval, somewhat three-sided, wrinkled, arilled, but in this specie the aril is so thin and delicate, as to be often removed by the time the seed is full grown.

Obs. Cattle are fond of it.

4. E. *indica. Gært. Carp.* i. *p.* 8. *t.* 1.

Erect, smooth, from one to two feet high. *Leaves* bifarious. *Spikes* from five to seven digitate. *Calyces* from three to five-flowered; *seed* oblong, three-sided, rugose.

Cynosurus indicus. *Linn. sp. pl. ed. Willd.* i. 417.

Hind. Mal-ank*uri*.

Teling. Kuror, viz. wild soloo.

A common coarse species, found growing in large tufts on pasture ground, road sides, &c

Culms ascending at the base, ramous, a little compressed, smooth, from one to two feet high. *Leaves* bifarious, large, with a few long white hairs scattered over the insides and sheaths. *Spikes* terminal, from three to six, expanding; one generally standing single a little below the rest, linear, secund, from two to four inches long; insertions glandular and hairy, spikelets in two rows on the underside. *Calyx* from three to five-flowered; *glumes* equal, as long as the flowers, smooth, and rather obtuse. *Corol*, valves smooth, obtuse. *Seed*

I. obtusely three-sided, rugose, arilled.

346 *Obs.* Cattle are not fond of it.

5. E. *verticillata. R.*

Erect, smooth, from one to four feet high. *Leaves* bifarious. *Spikelets* numerous, panicled. *Calyces* from eight to twelve-flowered; *glumes* daggered. *Seed* oblong, wrinkled.

It is a native of moist pasture ground.

Culms erect, round, smooth, from one to four feet high. *Leaves* as in the last described. *Panicle* erect, oblong, composed of many verticelled, expanding, round, sessile, linear spikes much resembling those of E. *indica; spikelets* imbricated in two rows on the underside o the spikes. *Calyx* from eight to twelve-flowered, corol-like. *Corol; exterior valve* ending in a long dagger; *inner valve* membranaceous. *Seed* oblong, wrinkled, arilled; in this specie the aril is fully as delicate as in E. *ægyptica*, and is nearly found whole on the full grown o ripe seed.

6. E. *calycina. R.*

Erect, from two to three feet high. *Panicle* linear. *Spikes* numerous, alternate; *glume* of the calyces equal, many times larger than those of the corol, daggered, three-flowered *Seed* three-sided, wrinkled.

Teling. Wadat*a*-tok*a*-g*u*ddee.

Grows in small tufts on dry pasture ground, but generally amongst bushes.

Culms erect, generally about two feet high, much covered by the leaves. *Leaves* very thinly scattered with hairs. *Panicle* linear, erect, from eight to twelve inches long, com posed of many sessile, expanding, alternate, secund spikes. *Spikelets* occupying, as in th other species, the underside of the spike. *Calyx* generally three-flowered, glumes equal twice as long as the three flowers they embrace, each ending in a long, sharp dagger. *Corol*

I. valves obtuse. *Seed* three-sided, wrinkled. I cannot say that I have seen the aril in this species

347 though I have often looked for it; it may therefore be a species of *Dactylis*.

ARUNDO. Schreb. gen. N. 124.

Calyx two-valved, containing one or more two-valved flowers, surrounded with long hairs.

1. A. *bifaria, Retz. Obs.* iv. 21. *Linn. sp. pl. ed. Willd.* i. 455.

Erect, smooth, leafy, from twelve to eighteen feet high. *Panicle* erect, linear, oblong, dense. *Calyces* three-flowered, much longer than the florets; *glumes* of the corol woolly.

Teling. Patoo-ederoo.

Is found chiefly among bushes on the banks of rivulets, lakes, &c. on the Circar mountains.

Culms sword-shaped, smooth, about ten to fifteen inches long, and from one to two broad. *Panicle* erect, oblong, very much crowded with innumerable ramifications, which stand erect and press close on one another while in seed. *Flowers* erect, on a common woolly pedicel within the calyx. *Calyx* three-flowered; *glumes* equal, pointed, larger than those of the flowers. *Corol*, exterior valve twice the size of the inner one, it is pointed and woolly on the outside. Page Carey Ed.

Obs. The leaves seem to be one of those sorts with which the Chinese line the inside of their sugar-candy tubs and other packages.

2. A. *Karka. Linn. sp. pl. ed. Willd.* i. 456. *Retz. Obs.* iv. 21.

Erect, smooth, leafy, from eight to twelve feet high. *Panicle* loose, verticelled. *Calyces*, from three to four-flowered *exterior glume* of the corols three-nerved, and daggered.

Sans. Nuda, Nula, Dhumuna, Potugula.

Beng. Nal, Nur.

Teling. Naga-sara maitantos. I.

Is a native of similar places with the last described. 348

Culms erect, ramous, from eight to twelve feet high, and as thick as the last, round, smooth, entirely covered with the sheaths of the leaves. *Leaves* approximate, sword-shaped, smooth, from twelve to twenty-four inches long, and one or one and a half broad; mouths of the sheaths bearded. *Panicle* bowing with the wind, but if not disturbed erect, oblong, composed of many filiform, erect, (in luxuriant plants drooping,) sub-verticelled, ramous branches. *Rachis* of the branches angular and hispid. *Florets* alternate, on a longer common woolly pedicel than in A. *bifaria*, within the calyx. *Calyx* from three to five-flowered; *glumes* unequal, the largest shorter than the exterior valve of the corol. *Corol*, exterior valve three-nerved, tapering into long fine subulate points, inner valve scarcely half so long. *Stamens* often only two, and the pistil is frequently wanting.

Obs. It does not agree with Retzius's description of A. *Karka* in the number of flowers in the calyx. Pipes are made of the culms, particularly those used by the people who carry about the dancing snakes.

In Bengal it is more luxuriant than on the coast. The common Durma mats of that place are made of the stalks split open. Vessels from the port of Calcutta are generally dunnaged with them.

3. A. *bengalensis. Linn. sp. pl. ed. Willd.* i. 455. *Retz. Obs.* v. 20.

Culms, from six to ten feet high, fistulous. *Leaves* bifarious, sword-shaped, drooping. *Panicle* lax; *valvelets* of the calyx equal, from two to three-flowered; exterior valve of the corol woolly, daggered, and three-nerved.

Beng. Gaba-nul.

This elegant species is found growing in ditches, and low places in the vicinity of Calcutta, where it blossoms during the months of October and November. I.

Culms erect, from six to ten feet high, fistulous. *Leaves* very numerous, approximate, 349
bifarious, drooping, sword-shaped, from one to two inches broad at the base, from thence taper to a fine point; smooth on both sides, and in the margins. *Sheaths* also smooth, with a long membranaceous margin round the mouth. *Panicle* oval, lax, from one to two feet long, erect; *ramifications* alternate, ramous, drooping a little. *Flowers* pedicelled, scattered. *Calyx* two or three-flowered; *valves* nearly equal, and of the length of the flowers. *Corol* exterior valve three-nerved, and woolly on the back, with a very fine, long, taper point. *Inner* valve small and smooth. *Nectary* two, cuneiform scales embrace the germ on the two sides.

Obs. The wool which girds the base of the corol, in most of the species, is in this species found growing on the back of its exterior valve.

ARISTIDA. Schreb. gen. N. 125.

Calyx two-valved, one-flowered. *Corol* one-valved, with three awns at the top.

1. A. *setacea. Retz. Obs.* iv. 22. *Linn. sp. pl. ed. Willd.* i. 460.

Erect, smooth, from two to four feet high. *Panicle* linear-oblong, composed of fifteen to to twenty sub-alternate, erectish ramifications.

Teling. Shipur-gadi.

Grows in a dry, barren, binding soil.

Root perennial. *Culms* straight, generally simple, from two to four feet high, and about as thick as a crow's quill at the base, solid, and of a very firm ligneous texture, round and smooth. *Leaves* few, narrow, margins involute, nerveless, smooth. *Panicle* bowing with the wind, linear, from six to twelve inches long, composed of sub-sessile, remote, adpressed ramifications. *Calyx, corol,* &c. as in the family, except that the three awns are erect. I.

Obs. Cattle do not eat it, yet it is very useful. The Telinga paper-makers construct 350
their frames of the culms; it also serves to make brooms and tooth-picks. It is employed in preference to other grasses for making the screens called *Tatties*, for this purpose it is spread thin on *bamboo frames*, and tied down; these placed on the weather side of the house, during the hot land winds and kept constantly watered during the heat of the day, renders the temperature of the air in the house exceeding pleasant, compared to what it is without. The thermometer in the outside exposed to the wind, but not to the sun, will then be at one hundred, or one hundred and fifteen degrees, or even more; and within if the *Tatties* are properly disposed and well watered, they will keep it down to from eighty-five to ninety, with two or even three rows of *Tatties*, made very thin, and all kept well watered, the thermometer, when it blows hard, may be brought down to eighty, but then it is absolutely chilling,

Page Carey Ed. and disagreeably cold. The difference between the open air and this refreshed air, is to feeling inconceivably great. The thermometer in the sun, at this season rises to from hundred and thirty to one hundred and forty. This contrivance we received from Bengal, by it the hot season which used to be so much dreaded, is now rendered to those who keep within doors tolerable. I have never observed any bad effects from this cool moist a however the hot season is the most healthy of the whole year.

2. A. *Hystrix. Linn. sp. pl. ed. Willd.* i. 459.

Culms diffuse, about two feet long. *Panicle* oval, large, thin; *ramifications* spreadi two-forked.

Teling. Shilpuroo-kalli.

This species is a native of the same soil with the last described.

Culms depressed, straggling, crooked, rigid, somewhat branchy, about two feet lo

I. 351 *Leaves* as in the last species. *Panicle* large, oval, thin; direction various, composed of verging, generally two-cleft peduncles and pedicels. *Calyx, corol,* &c. as in the genus.

Obs. This species is of no use that I know of.

3. A. *depressa. Retz. Obs.* iv. 22. *Linn. sp. pl. ed. Willd.* i. 461.

Ascending, ramous, from twelve to eighteen inches long. *Panicle* linear, of six to eig alternate ramifications; *glumes* of the calyces keeled.

Teling. Nalli-pootiki.

Is found upon the same kind of land with the two last species.

Culms below depressed, ramous; above ascending, filiform, round, smooth, solid, rigi from twelve to eighteen inches high. *Leaves* as in the former. *Panicle* smaller, and wit fewer ramifications than in A. *setacea. Calyx,* the glumes have a large green keel. *Corol,* & as in the genus.

Obs. This is also so far as I know, perfectly useless.

MANISURIS. Schreb. gen. N. 1570.

Polygamous. *Rachis* jointed. *Hermaphrodite* calyx two-valved, one-flowered. *Corol* two valved, less than the calyx. *Male,* or neuter calyx two-valved, one or two-flowered. *Coro* two-valved.

1. M. *Myurus. Linn. sp. pl. ed. Willd.* iv. 945. *Corom. pl.* 2. *N.* 117.

Culms creeping, from nine to eighteen inches high. *Spikes* solitary; exterior valve o the *hermaphrodite* calyx panduriform and emarginate; *male* calyx two-flowered.

Teling. Nalla-punookoo.

Is a native of dry elevated sandy ground.

Culms several, ramous, diffuse near the base, rooting at the joints, extremities ascending

I. 352 from nine to eighteen inches long, as thick as a crow's quill, compressed, smooth, not piped *Leaves* small, smooth; mouths of the sheaths increased by a lacerated membranaceous borde or stipule. *Spikes* solitary, terminal, and from the exterior arils peduncled, secund, jointed smooth, a little compressed, from one to two inches long. *Peduncles* articulated, and bracted at the middle. *Flowers,* the hermaphrodite ones occupy a waved row of pits on the four sides of the spike, while the male ones possess two sides, the back is naked.

Hermaphrodite Flowers. *Calyx* two-valved, one-flowered; the exterior valvelet ha a broad coloured margin, which is emarginate, and deeply indented at the sides, like a fiddle inner valvelet oblong, lodged in a pit of the rachis. *Corol* two-valved, membranaceous. *Nectary* two obcordate, crenulated scales embrace the germ. *Stamens* three. *Styles* two.

Male Flowers. *Calyx* two-flowered, two-valved, valvelets nearly equal, boat-shaped. *Corol* with two membranaceous valves. *Stamens* three. *Pistil* none.

2. M. *granularis. Linn. sp. pl. ed. Willd.* iv. 945. *Corom. pl.* 2. *N.* 118.

Ramous, sub-erect, hairy, from one to two feet high; *spikes* fascicled. *Hermaphrodite* calyx oval, and rugose; *male* or *neuter* one-flowered.

Grows among bushes.

Culms very ramous, nearly erect, filiform, hairy, from one to two feet high. *Leaves* numerous, very hairy, stiff and sharp. *Spikes* terminal, and axillary, peduncled, several together, small, compressed, from half an inch to an inch long. *Panicles* as in the former. *Rachis* jointed, much waved and excavated as in Rottbœllia. *Flowers* from four to ten of each sort, their situation exactly as in the last species, viz. the hermaphrodite occupy the forepart, while the male, or neuter are placed on the sides, the former are globular, and the latter lanceolate.

I. Hermaphrodite Flowers. *Calyx* one-flowered, two-valved, exterior valve round or rigid,
353 and very rugose; inner valve less rigid. *Corol* two-valved, membranaceous. *Stamens* three. *Styles* two.

Male or neuter Flowers. *Calyx* two-valved, one-flowered. *Corol* two-valved. *Stamens* three or none.

ROTTBŒLLIA. Schreb. gen. N. 1572.

Rachis (generally) jointed, variously excavated for the reception of one, or two flowers in a two-valved calyx, in each excavation.

1. R. *glabra. R.*

Near the base creeping, with extremities erect, smooth. *Leaves* bifarious, all hermaphrodite. *Calyx* one-flowered; *corol* three-valved.

Beng. Buksha.

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A native of Bengal, where it grows on pasture lands, the borders of rice fields, and other moist places. Cattle are fond of it.

Culms jointed, smooth, compressed, filled with pith, creeping near the principal root for a foot or more, the remaining part from one to two, or even three feet, erect. *Leaves* alternate, bifarious, approximate, short, spreading, ensiform, smooth. *Sheaths* shorter than the joints of the culm, smooth. *Spikes* axillary, solitary, or in pairs, with a solitary terminal one, subulate, three-sided, smooth, short-peduncled, the peduncles with generally a part of the spikes hid in the sheaths of the leaves ; general length from two to three inches. *Flowers* opposite, in general all, or the greatest part hermaphrodite, and as long as the joints of the rachis. *Calyx* one-flowered, two-valved, smooth, cartilaginous. The exterior valve of one of the pair obliquely emarginate, the other acute. *Corol*, the hermaphrodite and male three-valved, one valve on the inside, and two on the outside ; all tinged with deep red at the base. I.

2. R. *compressa. Linn. sp. pl. ed. Willd.* 465. *Corom. pl.* ii. *N.* 156. *Retz. Obs.* iii. 12. 354

Culms climbing, from five to twenty feet high, smooth, compressed ; *spikes* axillary and terminal ; *rachis* jointed ; *flowers* opposite, hermaphrodite calyces one-flowered. *Corol* three-valved.

Beng. Pansher*oo*.

Teling. Shervoo, *i. e.* lake p*a*nook*oo*.

It is found on the borders of lakes, amongst other roots of long grass, and brushwood.

Culms several, creeping or climbing, ramous, compressed, from five to twenty feet long, piped, smooth, about as thick as a common quill, and very hard. *Leaves* numerous, bifarious, small for the size of the plant, smooth and soft ; *sheaths* short, compressed, and smooth. *Spikes* peduncled, terminal, and from the exterior axills, generally from two to five together, compressed, a little smooth, from two to four inches long. *Peduncles* articulated at the middle and there bracted, lanceolate, chaffy, bractes also surround their insertion. *Flowers* all hermaphrodite, opposite, decussated, lodged in the excavations of the jointed rachis. *Calyx* one-flowered, two-valved, valves nearly equal ; the flowers have alternately their valves pointed and somewhat longer than the excavation in the rachis, both cartilaginous ; and obtuse, equal to the pits in the rachis, with the exterior one only cartilaginous. *Corol* three-valved, valves membranaceous. *Nectary*, two triangular bodies embracing the base of the stamens and germ. *Stamens* three. *Styles* two ; *stigmas* plumose.

3. R. *exaltata. Linn. sp. pl. ed. Willd.* i. 466. *Corom. pl.* 2. *N.* 157.

Polygamous. *Culms* erect, hirsute, from six to ten feet high. *Spikes* solitary, secund. Polygamous flowers on the front with neuter ones on the sides.

Beng. B*u*r*a*-swooate.

Teling. Konda pan*oo*k*oo*. I.

A native of mountains. 355

Root consisting of strong woody fibres. *Culms* erect, ramous, a little compressed, inwardly of a spongy nature, from six to ten feet high, and as thick as the little finger near the base, where they are armed with strong and short, white hairs. *Leaves* large and numerous, smooth on the outside, and hairy on the inside ; *margins* hispid ; sheaths very hairy ; hairs elevated on glandular points, very stiff and sharp. *Spikes* terminal, and from the exterior axills, generally solitary, cylindric, &c. *Flowers* of three sorts, hermaphrodite, male, and neuter, the first and second occupy alternate pits or one side of the spike, while the neuter stand on each side of them, so that the spike may be called secund. *Calyx* of the hermaphrodite and male floret two-valved. *Corol* as in the last. *Stamens* &c. as in the genus. *Calyx* of the neuter flower two-valved, valvelets oblong. *Corol*, glumes two, membranaceous.

4. R. *corymbosa. Linn. sp. pl. ed. Willd.* i. 443. *Corom. pl.* ii. *N.* 181.

Polygamous, erect, smooth, from three to five feet high. *Spikes* fascicled, terminal and axillary ; *rachis* jointed ; *flowers* alternate, on opposite sides of the spike. *Calyces* generally two-flowered.

Teling. Pedda-pan*oo*k*oo*.

R. punctata. *Retz. Obs.* iii. 12.

Aegilops eraltata. *Retz. Obs.* ii. 27.

A native of low rich pasture ground, grows in erect tufts.

Culms many, straight, mostly naked, the sheaths of the leaves being short and covering but a small part of them ; round and smooth, from three to five feet high, and like those of the last species, very firm, and not piped. *Leaves* a few, from six to twelve inches long ; *margins* sometimes fringed with a few hairs ; sheaths short and smooth. *Spikes* terminal and from the exterior axills several, peduncled. *Peduncles* filiform, curved, jointed near I. the base and there bracted, besides there are chaffy, filiform bractes at their insertions. 356 *Flowers* alternate in two rows ; one row on each side of the spike. *Calyx* two-flowered, two-valved. *Corol*, one hermaphrodite within, and one male without, each has two valves, sometimes there is only one hermaphrodite floret, in which case it has three valves.

5. R. *perforata. Corom. pl.* ii. *N.* 182.

Culms erect, smooth, from three to five feet high. *Spikes* solitary, below the flowers are [illegible], and the rachis perforated. *Calyx* generally two-flowered ; one flower male, the other hermaphrodite.

Beng. Kurki.

Teling. Panookoo.

This species is rather scarce, it grows on low rich pasture ground.

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Culms many, erect, simple, round, smooth, jointed, but not piped; from three to f feet high, and about as thick as a crow's quill. *Leaves* small for the size of the gra slender and smooth; *margins* hispid; *mouths* of the sheaths and a little way up the b of the leaves woolly. *Spikes* terminal, and from the exterior arils, solitary, peduncl round, smooth, as thick as a crow's quill, and from three to six inches long; where t flowers are opposite, there is an oblong perforation of the rachis, so that the backs of t inner glumes of the calyx touch one another. *Flowers* in pairs, nearly opposite on the low half or more of the spike; above alternate, sometimes all hermaphrodite, sometimes h maphrodite and male mixed. *Calyx* one or two-flowered, two-valved; *valvelets* simple; t exterior one rigid, the interior one firm and white, both obliquely linear-oblong. *Cor* when single, hermaphrodite, and three-valved; when double the exterior one is male, which case the two have four valves, viz. two valves each; all membranaceous, in sha conforming to that of the calyx, but smaller.

I. 357 6. R. *setacea. Corom. pl.* ii. *N.* 132.

Erect, setaceous, smooth, from two to six inches high. *Spikes* solitary, terminal, unil teral; *rachis* not joined. *Calyces* one-flowered. *Corols* two-valved, hermaphrodite.

Grows on old walls.

Culms many, erect, ramous, filiform, smooth, from two to six inches high. *Leaves*, insi a little hairy, in size proportioned to the plant. *Spikes* terminal, solitary, awled, secun about an inch, or an inch and a half long. *Rachis* excavated on one side, but not joine *Flowers*, they are all hermaphrodite, imbricated transversely on the excavated side of the r chis. *Calyx* one-flowered, two-valved; *valvelets* equal, membranaceous margined. *Corol* tw valved, membranaceous, hairy. *Stamens* three. *Styles* two.

7. R. *Thomæa. Linn. sp. pl. ed. Willd.* i. 464. *Corom. pl.* ii. *N.* 132.

Erect, compressed, about two inches high. *Spikes* solitary, terminal, two ranked. *Ra chis* not jointed. *Calyces* one-flowered. *Corol* two-valved.

R. Thomæa and pilosa. *Linn. sp. pl. ed. Willd.* i. 464. 5. are, I suspect this ver species.

Grows, with the last species, on old walls.

Culms minute, erect, compressd, about an inch high, exclusive of the spike, and tw with it. *Leaves* bifarious, numerous. *Spikes* terminal, solitary, subulate, distichous, com pressed. *Rachis* waved, excavated on the opposite side, not articulated. *Flowers* all herma phrodite, disposed alternately in the excavations of the rachis. *Calyx* one-flowered, two valved; *exterior* valvelet rigid, linear; *interior* boat-shaped, and less rigid. *Corol* two-valved membranaceous, hairy. *Stamens* three. *Styles* two.

I. 358 8. R. *biflora. R.*

Setaceous. *Spikes* simple, subulate; *rachis* not articulate, but bifariously excavate for the reception of the two-flowered spikelets.

A native of the Peninsula of India; and in size and appearance very like R. *Thomæa* an *setacea;* and were they not two-flowered in the same calyx I should no doubt have taken i for R. *incurvata. Linn.*

Culms scarcely more than may be called the scapes of the spikes, the whole plants bein but two or three inches high. *Leaves* many, filiform; *rachis* rigid, and with the sheath somewhat pilose. *Spikes* terminal, solitary, subulate, about two inches long. *Rachis* no jointed, but alternately excavated on the opposite sides for the reception of the flowers. *Caly* two-valved, two-flowered; *valves* very unequal, the exterior being many times larger than th inner one, which is a minute scale in the bottom of the excavations of the rachis, and no readily detected. *Florets* two in each calyx, both hermaphrodite, one sessile and the othe short pedicelled, each with a corol of two equal membranaceous, smooth valves.

HORDEUM. Schreb. gen. N. 129.

Calyx lateral, two-valved; valves narrow, acuminate, distant, altogether forming a six leaved involucre, one-flowered, by threes at each toothlet of the rachis.

1. H. *hexastichon. Linn. sp. pl. ed. Willd.* i. 473.

All the flowers hermaphrodite and awned, placed regularly in six rows.

Sans. Yuva, Situshooka.

Beng. Juba.

Arab. She-eer.

This species is much cultivated in most of the temperate parts of Hindoostan during th cool season.

I. 359

TRITICUM. Schreb. gen. N. 130.

Calyx two-valved, solitary, generally three-flowered.

1. *T. æstivum. Linn. sp. pl. ed. Willd.* i. 476.

Calyces four-flowered, ventricose, smooth, imbricate, awned.

Sans. Godhooma, Soomuna.

Beng. Gom.

Hind. Gioon.

Pers. Gundum.

Arab. Burr.

Two varieties are very generally cultivated in the interior and northern parts of Hin

doostan during the cool season. Page Carey Ed.

2. T. *hybernum. Linn. sp. pl. ed. Willd.* i. 477.

Calyces four-flowered, ventricose, even, imbricated, with little or no awn.

Two varieties of this species are also cultivated in the northern parts of Hindoostan during the cool season.

TRIANDRIA TRIGYNIA.

MOLLUGO. Schreb. gen. N. 139.

Calyx five-leaved. *Corol* none. *Capsule* superior, three-celled, three-valved, many-seeded. *Embryo* annular, and furnished with a perisperm.

1. M. *pentaphylla. Linn. sp. pl. ed. Willd.* i. 492.

Annual, diffuse. *Leaves* verticelled, cuneate-lanceolar. *Flowers* panicled.

Hind. and *Beng.* Khet-papara.

Teling. Veri Shadrasi.

A common weed in gardens throughout India. I. 360

2. M. *triphylla. Lour. Cochin Ch.* 79.

Annual, diffuse; *branches* angular, smooth. *Leaves* sub-verticelled, lanceolate, unequal. *Panicles* of long dichotomous racemes of alternate flowers. *Seeds* dotted.

Beng. Jul-papara.

Alsine multiflora. *Pluck. Phyt.* 21. t. 259. *f.* 2. good.

Mullugo stricta. *Linn. Syst.* 129. is probably the same plant, if so, the specific name is a very improper one. It is also a weed in gardens all over India.

3. M. *verticillata. Linn. sp. pl. ed. Willd.* i. 492.

Annual, diffuse, dichotomous, smooth. *Leaves* sub-verticelled, sessile, cuneiform peduncles inserted amongst the leaves, one flowered. *Seed* furrowed along the back.

Obs. Found over most parts of India, and a common weed in our gardens during the dry season chiefly.

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TETRANDRIA MONOGYNIA.

RHOPALA. Schreb. gen. N. 144.

Calyx none. *Corol* four-petalled, bearing the stamina above the middle. *Nectary* four-scaled. *Germ* one-celled ; *ovula* two, attached to one side of the cell.

1. R. *moluccana. Brown. Linn. Trans.* x. *p.* 191.

Leaves alternate, sub-sessile, oblong, entire, racemes axillary, and from the branchlets, longer than the leaves. *Nectarial* scales naked.

A native of Pulo Pinang.

As my description is taken from dry specimens I cannot say whether it be a tree or shrub, but the large woody specimens evidently show it to be perennial. *Leaves* short-petioled, alternate, obovate, oblong, obtuse-pointed, entire and smooth on both sides, six or more inches long and less than three broad. *Stipules* none. *Racemes* generally solitary, from the naked woody branchlets below the leaves, very long and completely clothed to the base with numerous beautiful, diverging, pretty large, delicate flowers. *Bractes* minute. *Calyx* none. *Petals* four, very long and slender, near the apex they expand into a concave lanceolate shape for the reception of the stamens ; they first open in the middle then at the apex, and soon after become revolute. *Nectary*, four scales embracing the lower part of the germ. *Filaments* four, short, inserted into the petals above the middle. *Anthers* linear, curved in an opposite direction to the petals. *Germ* above, ovate, style long and slender. *Stigma* clubbed. I. 362

2. R. *serrata. Brown. Linn. Trans.* x. *p.* 192.

Leaves alternate, sub-sessile, oblong, serrate. *Racemes* axillary ; *pedicels* two-flowered. *Nectarial* scales ciliate.

A native of the Malay Archipelago.

My description and drawing being from dry specimens, I cannot say whether it is a tree or shrub. Young shoots clothed with ferruginous down. *Leaves* alternate, short-petioled, oblong, acute, tapering at the base, serrate, firm and smooth on both sides ; from four to six inches long, and from one to three broad. *Spikelets* none. *Racemes* axillary, solitary, shorter than the leaves, clothed with ferruginous down. *Pedicels* two-flowered. *Bractes* minute, cordate, one at the base of each common pedicel. *Calyx* none. *Petals* few, long, slender, clavate; from the middle downwards, their sides touch, and form a slender tube. *Nectarial scales* four between the base of the petals and germ, obcordate, ciliate. *Filaments* four, inserted on the petals, about one-third below their apices. *Anthers* ovate. *Germ* superior, very hairy. *Style* as long as the corol. *Stigma* clavate. *Seed vessel* not seen.

3. R. *excelsa.* R.

Leaves alternate, short-petioled, cuneate-oblong, obtuse, pointed, smooth, with a few large blunt serratures near the apex. *Racemes* axillary and terminal, as long as the leaves, downy. *Nectarial* scales four, distinct, and naked.

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A large timber tree, a native of the forests of Chittagong, where it flowers in March April.

Trunk of the full-grown trees about four feet in circumference, covered with dark-co ed, scabrous bark; branches numerous, spreading far, and dividing much; young s clothed with ferruginous down. *Leaves* alternate, short-petioled, cuneate-oblong, ob pointed; interior margins generally with one, two, or three large, blunt serratures on
I. side, texture firm and polished; length from four to six inches, by two or three broad. *Rac*
363 axillary, and terminal, but chiefly the former, one, two, or three together, nearly as the le straight and simple, densely clothed with ferruginous down. *Pedicels* short, two-flow *Bractes*, a small oval one at the base of each common peduncle, and one about the midd each pedicel. *Flowers* numerous, crowded, small, yellowish green. *Calyx* none. *Petals* linearly spatulate, revolute. *Nectarial* scales four, rounded, smooth and distinct. *Fila* short, inserted on the petals. *Anthers* linear. *Germ* oblong, very completely covered long, reddish brown hairs, one-celled, and containing two ovula attached a little to one sid the bottom of the cell. *Style* filiform. *Stigma* clavate, entire.

4. R. *robusta. R.*

Leaves alternate, sessile, cuneate-oblong, smooth, remotely serrulate. *Racemes* axill and below the leaves, smooth. *Nectary* a smooth four-toothed cup.

Joweea, the vernacular name in Silhet where it is indigenous, and grows to be a la stout timber tree. Flowering in June.

Young shoots smooth. *Leaves* alternate, sub-sessile, cuneate-oblong, obtuse-pointed, motely and acutely serrulate, smooth on both sides, about twelve inches long, by five or broad. *Racemes* axillary, and below the leaves, one, two, or three together, about half length of the leaves, smooth. *Pedicels* short, two-flowered. *Bractes* smooth, one at the l of each common pedicel, and one about the middle of each of the proper ones. *Flowers* merous, pale, greenish yellow, and fragrant. *Calyx* none. *Petals* four, linearly spatul smooth, revolute. *Nectary* one-leaved, cup-shaped, obtusely four-toothed, with the marg somewhat ciliate. *Germ* superior, oblong, smooth, one-celled; ovula two, attached to one s of the cell. *Style* filiform. *Stigma* clavate, entire.

HEDYOTIS. Schreb. gen. N. 153.

I.
364 *Calyx* four-parted. *Corol* one-petalled, funnel-shaped. *Capsule* inferior, two-celled, mar seeded. *Receptacles* adhering to the partition their whole length. *Embryo* centripetal, a furnished with a perisperm.

1. H. *hispida. Retz. Obs. Bot.* iv. *p.* 23. *Linn. sp. pl. ed.* i. 565.

Diffuse, four-sided, rooting at the joints. *Leaves* sessile, lanceolate, with hispid margi *Flowers* axillary, crowded.

It sprung up and blossomed in December in the Botanic garden, amongst plants int duced from the Moluccas, in 1798-9.

Stem none, but several square, creeping branches, with their floriferous extremities ascer ing. *Leaves* opposite, sub-sessile, lanceolate; *margins* hispid, and entire, smooth, from t to three inches long; the connecting membrane divided into many subulate portions. *Flow* axillary, sessile, small, white. *Capsule* roundish, two-celled. *Seeds* numerous.

2. H. *geniculata. R.*

Weak, straggling, jointed, round, smooth. *Leaves* sub-sessile, lanceolate, smooth. *Flow* sub-verticelled, short-peduncled.

A native of the Malay Islands.

3. H. *scandens. R.*

Perennial, scandent, round, smooth. *Leaves* broad-lanceolate. *Panicles* corymbiform, t minal; mouth of the tube of the corol and apex of the style bearded.

Gujee, the vernacular name in Silhet, where it is indigenous; flowers and ripens its se during the hot and rainy seasons.

Stems and branches perennial, round, scandent. *Leaves* smooth, short-petioled, broa
I. lanceolate, smooth, entire. *Stipules* cup-shaped, connecting the leaves, with a short proc
365 on each side between the leaves. *Panicle* corymbiform, terminal, sub-globular, through trichotomous, all the ramifications a little villous. *Bractes* linear, spreading. *Calyx* fo toothed. *Corol* with the tube longer than the calyx, its mouth and the base of the four line segments of the borders of the corol very woolly. *Germ* oval, two-celled; *ovula* numero attached to the sub-globular receptacles, rising from the middle of the partition. *Style* long than the corol; *apex* woolly; *stigma* two-cleft. *Capsule* ovate, two-celled, many-seeded.

4. H. *lineata. R.*

Annual, diffuse, hairy. *Leaves* sessile, ventricose lanceolar, longitudinally marked wi simple, parallel veins. *Peduncles* axillary, two or three together, pretty long, many-flowere *Capsula* round, hairy.

Native of Chittagong, where it blossoms during the rains..

5. H. *Auricularia. Linn.*

Sub-dichotomous, diffuse, adscending, villous. *Leaves* lanceolate, sub-sessile, smoo above, many-nerved below. *Flowers* sub-sessile, densely whorled. *Capsules* villous.

Mariguti. Rheed. Hort. Mal. x. *pl.* 63. *t.* 32.

A native of Silhet and Nepal, where the plant blossoms during the hot and rainy seaso From the former place the plant was introduced in 1815 in the Botanic garden near Calcut by Mr. Smith.

Beng. Muttia-lata.

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Root fibrous. *Stem* short, woody, divided into many slender generally once or twice dichotomous roundish or slightly four-sided branches, measuring a foot in length, densely villous, sometimes rooting at the base. *Leaves* lanceolate, tapering and acute at both ends, an inch or an inch and a half long, even above, with several oblique villous nerves underneath, margins scabrous; pairs approximate and exceeding in length their interstices. *Petioles* very short, the uppermost somewhat longer, hispid, uniting into a membranaceous, villous, stipulary membrane, which is terminated by long hispid ciliæ. *Flowers* small, crowded into sessile, globose, axillary, copious, villous, verticils, concealing, but scarcely longer than the petioles and rendering their stipules reflexed. *Laciniæ* of the calyx linear. *Tube* of the corolla scarcely longer than the calyx. *Laciniæ* lanceolar, acute. *Throat* pubescent. *Stamina* exserted, erect, shorter than the limb of the corolla, with pubescent *filaments*. *Style* barbate. *Stigma* oblong. *Capsule* small, round, slightly furrowed.

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SPERMACOCE. Schreb. gen. N. 155.

Calyx four-leaved. *Corol* funnel-shaped. *Capsule* inferior, crowned, two-celled, two-valved. *Seed* solitary, longitudinally furrowed on the inside *Embryo* erect, and furnished with a perisperm.

1. S. *sumatrensis. Linn. sp. pl. ed. Willd.* 571. *Retz. Obs.* iv. 23.

Shrubby, erect, four-sided. *Leaves* lanceolate, remote, short-petioled. *Corymbs* terminal, decompound. *Capsule* opening from the base.

A native of moist places amongst the Circar mountains. Flowers during the rainy season.

Stem erect, woolly, obsoletely four-sided. *Branches* opposite, four-sided. *Leaves* opposite, spreading, short-petioled, lanceolate, downy; size very various. *Stipules* connecting, membranous, two or three-toothed. *Umbel* compound, terminal. *Flowers* white, very small. *Calyx* four-leaved. *Corol* with short, gibbous tube. *Capsule* oblong, two-celled, two-valved, two-partible from the base. *Seed* solitary.

Obs. This species ought to be carefully compared with *Hedyotis fruticosa, Rezt. Obs.* ii. 8; and the capsule of the same species in *Linn. Flor. Zeyl. N.* 63. should be well examined. The stipules seem the chief difference. In my plant they are always a lacerated connecting membrane.

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Knoxia corymbosa. Linn. sp. pl. ed. Willd. i. *p.* 582, which he considers as *Gærtner's* K. *stricta*, appears to me to be this plant. Indeed the two genera *Spermacoce* and *Knoxia* differ so little from one another as to induce me to think one of them might be spared.

2. S. *teres. R.*

Shrubby, erect, round, villous. *Leaves* opposite, remote, lanceolate, entire, villous. *Corymbs* terminal, decompound, alternate; divisions becoming *spikes* when in seed. *Stamens* erect, but hid in hairs. *Style* twice the length of the corol.

Knoxia umbellata, *Banks. Herb.*

Found by Dr. Buchanan in the woods of Koorg, from whence he sent the seed to the Botanic garden, where the plants thrive well, and blossom during the rainy season.

Stem erect, perennial, round, while young villous. *Branches* opposite, a little inflected, round and villous, height of the whole plant about three feet. *Leaves* opposite, short-petioled, lanceolate, downy, entire; length from two to four inches high. *Connecting* membrane with several erect, filiform divisions; when they accompany the divisions of the inflorescence, they are more numerous, and may be called an involucre. *Corymbs* terminal, brachiate, with the ultimate divisions lengthened into short spikes by the time the seeds are ripe. *Corol*, mouth of the tube shut with much long white hair, which entirely conceals the large, erect anthers lodged amongst it. *Style* erect. *Stigma* two-cleft with divisions involute.

Obs. This has much the habit of *Hedyotis fruticosa*, but differs widely in the stipules, (even if the pericarp of that plant should be that of a Spermacoce,) and in the form of the stem and branches. It is also very like S. *sumatrensis*, but there the branches are four-sided, here perfectly round; there the tube of the corol is smooth, short and gibbous, here cylindric, and shut with hairs; finally the capsule is there bipartible, opening from the base, with oblong brown seed, in reality it is that of a *Knoxia;* here it does not open spontaneously, and has black round seed.

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3. S. *exserta. R.*

Shrubby, straight, tender parts villous. *Leaves* remote, opposite, petioled, lanceolate. *Corymbs* terminal, decompound. *Stamina* and the bifid *stigma* exsert. *Capsule* oval.

A native of the Circars, where it blossoms in October and November.

Obs. Is nearly allied to S. *teres*; farther examination may prove them the same.

4. S. *glabra. R.*

Shrubby, round, smooth, erect. *Leaves* linear-lanceolate, smooth. *Corymbs* axillary, compound; *styles* hairy. *Stigma* clavate. *Capsules* globular, smooth.

A native of Pulo Pinang, has much the habit of a strong grass or slender bamboo, the situation of the leaves excepted.

Branches round, smooth, straight, jointed, in the dry specimens fistulous. *Leaves* opposite, sub-sessile, linear-lanceolate, smooth, entire, length from four to six inches; connecting membrane with unequal awned processes from its mouth. *Peduncles* axillary, bearing several cross-armed, minute umbellets or headlets of small cream-coloured flowers. *Bractes* minute. *Corol* bell-shaped, mouth of the tube hairy. *Style* longer than the corol, hairy. *Stigma* cla-

Page Carey Ed. vate, grooved. *Capsule* globular, smooth, size of a large pin's head.

5. S. *lævis. R.*

Biennial, straight, round, smooth. *Leaves* sub-sessile, lanceolar. *Corymbs* ter *Anthers* hid in the bearded mouth of the infundibuliform corol.

A native of the interior of Bengal; in the Botanic garden it blossoms and ripens its

I. 369 from September till February, and is by far the prettiest Spermacoce I have yet met wit *Stems* erect, perfectly straight, round, smooth. *Branches* opposite, and like the st whole height about three feet. *Leaves* opposite, sub-sessile, lanceolate, smooth, entire; one to three inches long. *Connecting* membrane divided into several subulate segm *Corymbs* terminal, compound and decompound. *Flowers* numerous, large, pale pink. *Br* small, and at the divisions of the corymbs chiefly. *Calyx* one of the four segments large the segments permanent. *Corol* funnel-shaped, before expansion the apex is large, with horns; after expansion these projections form a conical knob under the apex of each segm *Mouth* of the tube bearded. *Filaments* short; *anthers* linear, just within the tube. *Germ* celled, with one seed in each, attached to the top of the partition. *Style* longer than the of the corol. *Stigma* bifid. *Segments* revolute. *Capsule* oblong, crowned, two-celled, two-val *valves* keeled on the back. *Seed* solitary, longitudinally grooved on the middle of the insi

Obs. It may be readily distinguished from S. *teres* (the only species known to me it can be mistaken for) by its smoothness, greater size of the flowers, and the segment their borders being enlarged with a conic knob on the outside of their points.

6. S. *lineata. R.*

Erect, ramous, hairy. *Leaves* short-petioled, lanceolate, acuminate, linear. *Stip* triangular and shaggy. *Heads* axillary on trichotomous short peduncles. *Stamina* truded.

A native of the Moluccas. The lineate, hairy, very acute, tapering leaves, long sha triangular stipulæ, and small peduncled heads of axillary flowers, readily distinguish species from all the other East Indian species known to me.

I. 370 7. S. *nana. R.*

Erect, simple, nearly round and smooth; *leaves* petioled, lanceolate, entire, smoo *Flowers* axillary and terminal, sessile, crowded.

A very small species, less than six inches high, a native of the Island of Honimoa.

8. S. *stricta. Linn. sp. pl. ed. Willd.* i. 573.

Annual, erect, four-sided. *Leaves* sessile, linear-lanceolate. *Flowers* in dense, globul axillary verticils. *Capsules* scabrous, gaping at the apex.

Teling. Sookukada.

An annual, a native of wet rice fields, appears and flowers during the rainy season.

Stem erect, branchy, four-sided, about a foot high, angles acute and scabrous. *Branch* decussated, stem-like, but slenderer. *Leaves* opposite, sessile, lanceolate, entire, a little s brous. *Stipule*, a connecting membrane, ciliate. *Verticils* globular. *Involucres* leaf-li *Flowers* most numerous, minute, white. *Tube* cylindric. *Stigma* globular. *Capsule* tw celled, opening at the apex. *Seed* solitary.

9. S. *costata. R.*

Diffuse, very downy. *Leaves* broad-lanceolate, or oblong, ribbed. *Flowers* crowded little axillary, proliferous umbellets. *Staminæ* protruded.

Hedyotis Auricularia. Linn.

Supposed to be a native of the Moluccas, as the plant sprung up in the Botanic gard from some earth brought with the spice plants from those Islands in 1800. It blossoms a ripens its seed during the greatest part of the year.

Root biennial, if not perennial. *Stems* or rather branches many, diffuse, round, fr one to three feet long, clothed with long, soft diverging hairs. *Leaves* opposite, sub-sessi broad-lanceolate, entire, ribbed with numerous large, simple, parallel veins; downy on bo

I. sides, from two to three inches long, and about one broad; connecting membrane wi 371 generally three, unequal, slender, subulate divisions. *Flowers* axillary, numerous, pale pi very small, crowded together into small round heads, on short peduncles, and pedicels, t whole forming little, proliferous, villous umbels. *Involucre* and *involucels* annular, villo from three to six-parted. *Calyx*, divisions equal, acute, hairy. *Corol* funnel-shaped, hai on the outside, and in the throat of the tube; divisions of the border recurved. *Stame* protruded beyond the mouth of the corol. *Germ* beneath, broad-turbinate. *Style* about long as the tube of the corol. *Stigma* two-cleft, villous. *Pericarp* with two seeds.

10. S. *semierecta. R.*

Stem variously bent, but ascending, square. *Branches* brachiate, alternately small *Leaves* ovate. *Flowers* in small, compact verticils. *Stamens* and *style* inclosed. *Caps* turbinate, hairy.

A native, I suppose, of Sumatra, as the plant from which this description is taken, spru up in a bed, where earth from that Island had been thrown, and in one year was about a f and a half high.

The *lower branches* brachiate; the *superior* often solitary, they are all very exactly fo sided with angles sharp and somewhat hispid; in other respects they are very smooth. *Lea* opposite, with smaller ones in their axills, short-petioled, acuminate, entire, very slightly s brous, particularly the margins, with nerves and veins on the underside. *Connecting* m brane divided into several filiform portions. *Flowers* numerous, very small, white, sessi collected into small compact, round verticils. *Corol*, divisions of the border bearded in t centre. *Anthers* within the tube.

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11. S. *scabra. Linn. sp. pl. ed. Willd.* i. 572.

Annual, diffuse, round, hairy. *Leaves* opposite, sessile, round, obovate, the hairy margins much curved, and somewhat curled. *Flowers* axillary, sessile. *Stamens* and *style* erect.

Tardavel. *Rheed. Hort. Mal.* 9. *p.* 149. *t.* 76. The leaves however are a little too sharp for our Coromandel plant.

Stem short and generally annual. *Lower branches* opposite, *superior* alternate, round, coloured, very hairy, somewhat scabrous, weak, spreading and variously curved. *Leaves* opposite, sessile, round, obovate, or nearly oval, somewhat acute; hairy on both sides, edges recurved and more or less curled. *Connecting* stipule with three, four, or five filiform processes. *Flowers* axillary, generally in pairs, though often several together, but expanding in succession, sessile, small, purple. *Calyx*, the four divisions or in this species rather leaflets, lanceolate, nearly as long as the tube of the corol. *Corol* sub-campanulate, half four-cleft. *Stamens* as long as the segments of the corol. *Style* as long as the stamens. *Stigmas* two, two-lobed, segments revolute. *Capsule* oval, two-celled. *Partition* membranaceous. *Seed* solitary, oval, equally obtuse at each end.

12. S. *articularis. Linn. sp. pl. ed. Willd.* i. 572.

Annual, diffuse, four-sided. *Leaves* opposite, sessile, broad-lanceolate; connecting stipules from three to five-bristled. *Flowers* verticelled. *Corol* infundibuliform, four times longer than the calyx. *Stamens* and *style* erect.

A native of the sandy soil on the coast of Coromandel near the sea, and in flower the greatest part of the year.

Root generally annual. *Stem* scarcely any, but many diffuse straggling, four-sided, alternate, hispid branches from one to two feet in length. *Leaves* opposite, sessile, lanceolate, a little hairy; veins simple, from one to two inches long, and half an inch broad. *Connecting* stipules cup-shaped, with from three to six bristles from each side. *Flowers* axillary, sessile, two, three, or four, expanding in succession from the same axill. *Calyx* with slender, linear divisions. *Corol* infundibuliform. *Tube* slender, three or four times longer than the calyx. I. 373 *Stamens* erect. *Stigma* erect, bifid; lobes broad, and revolute. *Capsule* two-celled, partition membranaceous. *Seed* solitary, oval, furrowed on the flat side.

13. S. *hispida. Linn. Mant.* 558. *sp. pl. ed. Willd.* i. 572.

Annual, with diffuse, obsoletely four-sided, hairy branches. *Leaves* obovate, cuneate, waved, scabrous. *Flowers* verticelled, two, three, or four in each axill. *Tube* of the corol twice the length of the calyx. *Stamens* and *style* erect.

Teling. Madana-bunta-kada.

Galeopsis zeylanica. *Burm. Zeyl.* 20. *f.* 3. agrees pretty well with my plant except in the numerous pedicelled flowers.

Common on the sandy lands near the sea on the coast of Coromandel.

HYDROPHYLAX. Schreb. gen. N. 159.

Calyx four-parted; *corol* campanulate. *Germ* two-celled, one-seeded, inferior. *Capsule* inferior, angular, two-celled. *Seed* solitary; *embryo* erect, and furnished with a perisperm.

1. H. *maritima. Linn. sp. pl. ed. Willd.* i. 581.

Sarissus anceps. *Gært. carp.* i. *p.* 118. *t.* 25. *f.* 4.

Diodia orientalis. *Kön. Mss.*

A native of the sand hills along the shores of Coromandel and Malabar, where it is in blossom most part of the year.

Root perennial. *Stem* none, but many long, slender, variously bent, striking, round, coloured branches running over the sand and often striking root from the joints. *Leaves* opposite, approximate, short-petioled, from a deep, stem-clasping, dentate cup. *Flowers* axillary, sub-sessile, one or two together, of a pale pink colour. *Calyx* above, four-parted; divisions ensiform, permanent. *Corol* campanulate, tube hairy on the inside near the bottom, the four divisions of the border ovate, spreading, with their apices somewhat revolute. *Filaments* I. four, erect, shorter than the corol, and inserted on the mouth of its tube, opposite to its 374 fissures. *Anthers* purple. *Germ* oblong. *Style* length of the corol. *Stigma* of two round lobes. *Pericarp* when ripe a dry berry, of a lanceolate shape, crowned with the remaining calyx, two-celled, with a single linear oblong seed in each, as detailed and figured by that very eminent and most accurate botanist Gærtner.

RUBIA. Schreb. gen. N. 164.

Calyx scarcely any. *Corol* one petalled, from four to five-parted. *Berries* inferior, twin. *Seeds* solitary. *Embryo* erect, and furnished with a perisperm.

1. R. *Munjista. R.*

Perennial, scandent. *Leaves* four-fold, long-petioled, cordate, acute, from five to seven-nerved, hispid. *Corol* flat, five-parted, pentandrous. Fleming in *Asiat. Res.* xi. 177.

Sans. Munjistha, Vikusa, Jingee, Sumunja, Kalumeshika, Mundooku urnee, Bhundeeree or Bhundiree, Bhundee, Yozunuvullee.

Beng. Munjit or Munjistha.

A native of Nepal, and other mountainous countries, north and north-east of Bengal. It grows in the Botanic garden at Calcutta, but requires uncommon care to keep it alive during the rainy season, and has never blossomed there.

Root perennial. *Stems* woody, scandent, climbing over trees and bushes. *Branches*

Page Carey Ed. cross-armed, from the axill of the large pair of leaves, jointed, swelling at the joints, hair a little distance below them, four-sided; angles sharp and armed with small, recurved prick the exterior cortex, which forms these angles, drops off by age, leaving the longer bran and stems round, and covered with a soft reddish somewhat downy bark. *Leaves* four

1. 375 petioled, one of the pairs always much larger, viz. about double the size of the other, and longer petioles, all are beautifully cordate, entire, acute, pointed, generally five or s nerved, though in the largest there are sometimes nine, and in the smallest three, or sometimes obliterated; these nerves are armed with small recurved prickles, like those o angles of the branchlets; both sides channelled. *Panicles* terminal, oblong, composed of merous, opposite, small, sub-globular, trichotomous panicles from the axill of the floral le *Pedunculs* and *pedicels* four-sided, smooth. *Bracteæ* opposite, sessile, long, cordate. *Flo* numerous, minute. *Calyx*, if any, so minute as not to be visible. *Corol* flat, five-par divisions lanceolate, acute, with points inflected. *Stamens* five, shorter than the corol. beneath, twin. *Style* scarcely any, stigma large, two-cleft. *Berries* two, or one; the se not always coming to maturity globular, size of a small grain of pepper, smooth. *Seed* gle, round, smooth, with a deep pit on one side.

Obs. It differs from R. *cordifolia* in being pentandrous. The roots, stems, and lar branches are used to dye red with.

IXORA.* *Schreb. gen. N.* 167.

Calyx four-toothed. *Corol* one-petalled, funnel-shaped. *Tube* long, with the stamin its mouth. *Germ* two-celled, one-seeded, lateral. *Berry* inferior, two-seeded. *Embryo* cr curved, and furnished with a perisperm.

1. I. *coccinea*. *Linn. sp. pl. ed. Willd.* i. 609.

Shrubby. *Leaves* oblong, cordate, sessile, acute, smooth, entire. *Segments* of the co

1. 376 ovate-lanceolate, acute. *Berry* crowned with the shut segments of the calyx.

Schetti. *Rheed. Mal.* ii. *p.* 17. *t.* 12. is a pretty good figure of it, but the descript of the colour of the flowers does not so well agree.

Jasminum flore tetrapetalo. *Raii. Zeyl.* 125. *t.* 57. good.

In the Tanjore country and in China I have found this most beautiful shrub in gr abundance in its wild state. In a cultivated state it flowers all the year round. I have h it eight years in my garden, and it is not more than three or four feet high, with many cr branches, but scarcely any thing like a trunk.

Leaves opposite, sessile, approximated, decussate, oblong, pointed, entire, smooth, shinin from three to four inches long, and one and a half broad. *Stipules* within the leaves with awled process on each side. *Corymb* terminal, three-forked. *Bracteæ* small, rigid. *Pe duncles* and *pedicels* short, coloured. *Flowers* numerous, pretty large, bright scarlet, in dorous. *Calyx* four-toothed: divisions acute. *Corol*, *stamens* and *pistil* as in the gen *Berry* size of a small cherry, red, juicy, two-celled. *Seed* solitary, convex on one side, a flat on the other.

Obs. Flamma sylvarum. *Rumph. Amb.* iv. *p.* 105. *t.* 43. is a very bad represent tion of this species, and much more like my *Ixora fulgens*. I have therefore doubtfully qu ed it for that plant.

2. I. *Bandhuca*. *R.*

Shrubby, spreading. *Leaves* oval, stem-clasping. *Corymbs* crowded. *Segments* of t corol ovate, obtuse. *Berries* crowned with the open calyx.

Asiat. Res. iv. *p.* 250.

Sans. Rektaka, Bandhooka, or Bandhooka Bandhoojeevaka.

Beng. Rungun, Rajana.

A very elegant, uncommonly ramous, bushy shrub, a native of Hindostan. Sir W

1. liam Jones observes that the flower is often mentioned by the best Indian Poets. It is 377 flower the whole year but chiefly during the rains, when it is highly ornamental.

Stem none, but branches innumerable, which divide much and spread close on the groun forming a large hemispherical bush. *Bark* of the large branches dark brown, and rat scabrous: that of the young shoots, smooth, and green. *Leaves* opposite, stem-clasping, oblo obtuse, with a small point, entire, firm, smooth on both sides. *Stipules* inter-foliaceous, annul with a subulate process on each side. *Corymbs* terminal, crowded, divisions many, but sm *Flowers* numerous, when they first open scarlet, changing afterwards to crimson. *Bra* opposite, conic, acute. *Calyx* superior, four-toothed, coloured, permanent. *Corol* with a ve long slender tube; *segments* of the border four, ovate, rather obtuse, spreading. *Filaments* sh short, inserted without the mouth of the tube, spreading; anthers linear, spreading. *Ge* two-celled, with one seed in each, attached to the middle of the partition. *Style* length the tube of the corol. *Stigma* bifid. *Berry* spherical, size of a large pea, smooth, fl when ripe purple, two-celled. *Seed* solitary, oval, convex on the outside flat, with a deep p on the inside. *Integuments* two: *exterior* membranaceous. *Perisperm* co form to the seed, cartilaginous. *Embryo* erect, curved, nearly as long as the perisperm. *Cot dons* roniform, cordate. *Radicle* cylindric, longer than the cotyledons, inferior.

Obs. This species is nearly allied to I. *coccinea*, but differs in the following respects:

1st. This is a very ramous spreading bush, that much less so and nearly erect.

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* Sir William Jones observes (*Asiat. Res.* iv. 253) that an Indian girl was ever named Ixora; adds at the same time, that Ishwara which is indeed a title of Siva, would be a very improper appe tion of a plant which was already a classical name.

2d. In this the leaves are stem-clasping, and obtuse; in that sessile and acute. Page Genus 2d. I. 378

3d. In this the segments of the limbs of the calyx are ovate, and rather obtuse; in that ovate-lanceolate, and acute; and lastly, I. 378

4th. The calyx of this [illegible] I. 379

3. I. *fulgens. R.*

Shrubby. *Leaves* sub-sessile, lanceolate, acute. *Corymbs* terminal, highly coloured. *Segments* of the calyx ovate. *Tube* of the corolla very slender, with a pubescent mouth; *segments* lanceolate, and larger than the erect stamens. *Berries* two-lobed.

Flamma sylvarum. *Rumph. Amb.* iv. 105. *t.* 46? pretty good.

This plant, which ornaments [illegible] in a garden of the Botanic [illegible] was introduced into the Botanic garden, where it blossoms most part of the year.

Trunk short, [illegible] with smooth dark-brown bark. *Leaves* opposite, short-petioled, lanceolate, entire, acute, smooth on both sides, [illegible] an acute point on each side. *Corymbs* terminal, composed of short, decussate, highly coloured branches, and branchlets, supporting numerous, short-pedunceled, long-tubed, pretty large, [illegible] with the [illegible] *Berry* [illegible], nearly round, convex on the back, with a deep cavity on the inside, and from [illegible] by a thick short cord to the centre of the partition. *Integuments* two, the *exterior* corresponding with what Gaertner calls the *arillus* in *Coffea*, ash-coloured, and firm [illegible] the *interior* membranous and [illegible] the perisperm, curved. *Cotyledons* two, cordate. *Radicle* sub-clavate, inferior. I. 379

4. I. *stricta. R.*

Shrubby, erect. *Leaves* sub-sessile, oblong. *Corymbs* dense, compound, hemispheric. *Laciniæ* of the corol round, spreading. *Anthers* bristle-pointed.

Ixora coccinea. Lourier, Cochin Ch. 95. Curtis's Botanical Magazine, No. 169.

Flamma sylvarum peregrina. *Rumph. Amb.* iv. 107. *t.* 47.

This [illegible] was brought to the Botanic garden from the Eastern [illegible] in 1795, where it is [illegible] but rarely flowers in winter. The plant, when in flower is highly ornamental, though by no means so gaudy as I. *coccinea* and *Bandhuca*, which are certainly two of our most showy Indian shrubs.

Trunk scarcely [illegible] but a few [illegible] with [illegible] brown smooth bark; height from three to four feet. *Leaves* opposite, sub-sessile, oblong, entire, smooth on both sides. *Stipules* interfoliaceous, long, taper, acute-pointed. *Corymbs* terminal, [illegible] branches, and [illegible] [illegible] of a bright, deep red colour. *Flowers* numerous, [illegible] [illegible] [illegible]

Page Carey Ed. very numerous, pure white, fragrant. *Calyx* four-cleft to the base, divisions long, narrow acute. *Tube* of the corol cylindric, very slender, three quarters of an inch long; the four segm of the border oblong and obtuse. *Filaments* from the inner edges of the fissures of the bo of the corol. *Anthers* narrow, sagittate. *Germ* oval, two-celled, with one seed in each, att ed to the middle of the partition. *Stigma* of two linear lobes, elevated considerably a the mouth of the tube. *Berry* round, turbinate, size of a small cherry, when ripe bright and smooth, two-celled. *Seed* solitary, round, oval, convex on the outside, with a large pit on the inner. *Integuments* two; *exterior* nuciform; *inner* membranaceous, and green *Perisperm* conform to the seed. *Embryo* erect, curved like the convex seed. *Cotyledons* niform. *Radicle* cylindric, length of the cotyledons, inferior.

Obs. Vahl's figure of I. *parviflora, Symbol. Bot.* iii. *t.* 52, is much like this plant; description however agrees better with what I have always considered to be his *parvifl* and which is so labelled in Sir Joseph Banks's *herbarium.* They differ in the following pects. That *(I. parviflora)* is a tree, this a shrub; in that the leaves are linear oblong w a cordate base, of a much firmer texture, and more polished; in this they taper for two-thi of their length to the base, (hence the specific name *cuneifolia.)* In that the segments of calyx are short and obtuse, in this long and acute. In that the berries are round and blac in this short, turbinate and red. The corymbs also differ somewhat. In both species flowers are white, but in this much larger.

7. I. *brachiata. R.*

Shrubby. *Leaves* short-petioled, lanceolar. *Panicles* brachiate, with remote, divergi branches.

A stout shrub, a native of the forests of Bengal. In the Botanic garden it flowers I. March, and the seeds ripen in May.

382 *Trunk* erect. *Branches* opposite, spreading much, but they are not so numerous as in *parviflora. Bark* brown, and pretty smooth. *Leaves* opposite, short-petioled, lanceolar, ob tuse, smooth, of a hard texture, from four to six inches long, by less than two broad. *St pules* triangular, acute. *Panicles* terminal, brachiate; *ramifications* few, remote on long round, smooth peduncles. *Flowers* numerous, minute, much smaller than in I. *parviflora Calyx* small, deeply four-toothed, coloured. *Corol* with a filiform tube; *segments* of the bo der obovate, emarginate. *Filaments* none. *Anthers* linear, attached by their backs to th bottom of the fissures of the border of the corol. *Germ* turbinate, two-celled, with one see in each, attached to the partition. *Style* scarcely longer than the tube. *Stigma* large, two lobed. *Berry* the size of a large pea, smooth, succulent, dark brown purple, two-celled. *Seed* solitary, round, convex, on the outside concave, with a pit on the inner. *Integuments* two *exterior* white, hard, thin, and elastic; *inner* tender and thin. *Perisperm* acetabuliform amygdaline. *Embryo* erect, curved. *Cotyledons* cordate. *Radicle* cylindric, curved, inferior

Obs. A handsome shrub, and nearly allied to Vahl's I. *parviflora,* though very differ ent from the plant so labelled in the *Banksian herbarium,* which grows in abundance in thi garden.

1*st.* In the shape of the leaves, which in that species are sub-sessile, and generally hav a broad stem-clasping base; in this the petiole is about half an inch long, and the leaves tape more towards the base than at the exterior end.

2*d.* In the thinness of the panicle, (though of the same conformation), and the size o the flowers, which in this species are much smaller, and every way more delicate, and also i their shape, which in that species is oblong before expansion, but in this round.

I. 3*d.* In this the anthers are sessile, in that they have short filaments.

383 8. I. *villosa. R.*

Shrubby. *Leaves* broad-cuneate, lanceolar, villous underneath. *Corymbs* super-decom pound to the sixth or seventh degree, divisions trichotomous, villous. *Calycine* segment oblong and ciliate.

Beng. Choonaree.

This species is a native of Silhet, where it grows to be an elegant middling sized shrub with large crowded corymbs of fragrant white flowers, which appear in May and June.

Young shoots straight and villous. *Leaves* opposite, short-petioled, broad-cuneate, lan ceolar, entire, acuminate, underneath soft with very short down; from six to ten inches long by from two to four broad. *Stipules* downy, with the ends subulate. *Corymbs* terminal, from four to eight times trichotomous, all the divisions downy, and the last three-flowered. *Brac tes* opposite, downy; two slender small ones pressing the base of each calyx. *Calyx* four parted, segments oblong, ciliate. *Corol* with a very long, smooth, filiform tube; segments of the border four, oblong, spreading; in the oblong obtuse bud they are imbricated.

9. I. *acuminata. R.*

Shrubby. *Leaves* petioled, lanceolar, acuminate, smooth; *floral* pair stem-clasping, and broader. *Corymbs* super-decompound, much crowded, and smooth. *Calycine* segments ensi form.

A very charming shrubby species, a native of the forests near Silhet, where it blossoms during the hot season, and perfumes the air with the fragrance of its flowers.

10. I. *parviflora. Vahl. Symbol.* iii. *p.* 11. *t.* 52. *Linn. sp. pl. ed. Willd.* i. 609.

Arboreous. *Leaves* sub-sessile, oblong, smooth. *Panicles* ovate oblong, decussated. *Laci niæ* of the corol ovate. *Style* hairy. *Berries* round.

I. *Beng.* Gundhul-rungun.

384 *Teling.* Tadda-pullu.

Among the mountains of the coast of Coromandel this species grows to be a pretty large tree; in the low lands it is much smaller, seldom exceeding fifteen or twenty feet in height.

Flowering time February and March.

Bark dark-coloured, scabrous. *Leaves* opposite, short-petioled, linear-oblong, pointed at the base, often cordate; smooth, shining, firm, entire, from three to four inches long, and from one and a half to two broad. *Stipules* as in I. *coccinea*. *Panicles* ovate, terminal, erect, cross-armed; *divisions* always three-forked. *Bractes* at the principal divisions stipulaceous, with four subulate processes; the rest are small, one below each ramification. *Flowers* small, white, fragrant. The style is hairy. *Berry* generally two-seeded, somewhat two-lobed, size of a pea, black.

11. I. *barbata. R.*

Tube of the corol long; *mouth* bearded. *Leaves* opposite, short-petioled, oblong, entire, smooth, shining; *floral* leaves, round cordate, sessile. *Panicles* open.

This elegant, densely ramous, large shrub, or small tree, I have found only in the Botanic garden. Flowering time the hot season.

Trunk scarcely any, branches numerous, opposite. *Leaves* opposite, short-petioled, oblong, entire, smooth, and shining on both sides, from six to nine inches long. *Stipules* within the leaves as in the other species. *Corymbs*, or rather panicles terminal, decompound, large, diffuse, always trichotomous, smooth in every part. *Bractes*, the lowermost pair embracing the base of the common peduncle, large, and cordate, (they may be called floral leaves;) the rest gradually decrease in size till they become very minute at the ultimate divisions. *Calyx* as in the genus, with acute divisions. *Tube* of the corol long and slender, its mouths crowned with long white hairs. *Style* the length of the corol. *Stigma* clubbed, just without the mouth of the tube, apex slightly bifid. *Berry* red, smooth, size of a pea, two-seeded.

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Obs. Bem-Schetti, *Rheed. Mal.* ii. *p.* 19. *t.* 13, is a tolerable representation of this plant, but a bad one of what I consider to be *Ixora alba*.

12. I. *undulata. R.*

Leaves opposite, broad-lanceolar, acute, much waved. *Panicles* terminal, open; *divisions* of the calyx acute. *Filaments* as long as the anthers. *Stigma* two-cleft. *Berries* transversely oval.

Beng. Paluka-Jooi.

A ramous shrub, a native of forests in Bengal, flowering time the hot season.

Leaves opposite, sub-sessile, spreading, broad-lanceolar or oblong, pointed, margins much waved, smooth on both sides but not shining. *Stipules* within the leaves, with a long awled process on each side. *Corymbs* or rather panicles terminal, decompound, &c. as in I. *barbata*, but much smaller. *Bractes* as in the other species. *Flowers* numerous, small, white. *Calyx*, divisions acute. *Corol*, divisions on the border reflexed, rather shorter than the tube. *Filaments* from the fissures of the corol, pretty long, spreading and variously bent. *Anthers* as in the genus. *Style* rather longer than the tube. *Stigma* two-cleft; *divisions* recurved.

13. I. *Pavetta. R.*

Shrubby. *Leaves* short-petioled, smooth, entire. *Panicles* fastigiate, axillary, and terminal. *Style* twice the length of the corol. *Stigma* entire. *Berries* globular.

Pavetta *indica. Linn. sp. pl. ed. Willd.* i. 610.

Pavetta, s. Malleamothe. *Rheed. Hort. Mal.* v. 19. *t.* 10, is certainly this plant.

Beng. Kookoora-choora.

Teling. Nooni-papoota.

I. 386.

A middle sized shrub, common on road sides, hedges, uncultivated lands, &c. where there is a good soil.

Branches cross-armed, ascending. *Bark* ash-coloured. *Leaves* opposite, petioled, oblong, entire, pointed, always smooth on both sides, which forms the chief difference between this and the next species; from four to six inches long, and two, or two and a half broad. *Stipules* as in the former species. *Corymbs* compound, terminal, large, nearly level-topped, cross-armed. *Peduncles* and *pedicels* round, and smooth. *Bractes* as in the former species. *Flowers* white, somewhat fragrant. *Calyx, divisions* obtuse. *Style* twice the length of the tube. *Stigma* clubbed. *Berry* globular, size of a pea, one or two-seeded.

14. I. *tomentosa. R.*

Shrubby. *Leaves* oblong, ventricose, entire, tomentose. *Panicles* lax, sub-globular, tomentose; *style* twice the length of the corol. *Stigma* entire. *Berries* globular.

Beng. Jooi.

Teling. Nam-papoota

A large shrub, native of the same places, but not so common as the last described. Flowers the beginning of the hot season.

Branches cross-armed, ascending. *Bark* ash-coloured. *Leaves* opposite, petioled, ovate, pointed, entire, both sides very downy, from four to eight inches long, and from three to five broad. *Stipules* as in the former species. *Panicles* terminal, globular, cross-armed, divisions always three-forked. *Peduncles* and *pedicels* round, downy. *Bractes* as in the former species. *Flowers* numerous, white, faintly fragrant. *Style* twice the length of the tube. *Stigma* clubbed. *Berry* generally two seeded.

Obs. In all the foregoing species the berries are two-seeded, though it often happens that but one comes to perfection. I never met with any that had three or four. I do not find that the inhabitants of these parts make use of the trees, except for fuel.

I. 387.

15. *tenuiflora. R.*

Leaves petioled, oblong, obtuse, smooth. *Panicles* terminal, corymbiform, contracted. *Segments* of the calyx cordate, and obtuse, tube of the corol long, and most slender.

Page Carey Ed. *Segments* of its border oblong, obtuse, and longer than the erect style, or stamina.

A native of the Moluccas, and with flowers infinitely more delicate than I. *fulgens* w it most resembles.

16. I. *congesta. R.*

Shrubby. *Leaves* short-petioled, oblong, strongly veined. *Corymbs* terminal, short, d *Flowers* sub-sessile. *Segments* of the calyx obscurely reniform; those of the border of corol oblong, and obtuse.

A native of the Moluccas, and differs from I. *fulgens* in the firm somewhat coriac leaves, with stronger parallel veins.

17. I. *lanceolaria. Colebr.*

Shrubby, smooth; *branches* slender, pendulous, sub-dichotomous. *Leaves* in approxin pairs, very long, linear-lanceolate, acuminate, short-petioled. *Corymb* terminal, sub-ses small, with coloured scaly, crowded *peduncles*. *Tube* of the corol filiform; *lacinice* linear-obl *Anthers* linear, with deeply bifid base.

A native of Travancore. Introduced into the Botanic garden by Dr. A. Berry in 18 Time of blossoming the hot season; the fruit ripens towards the close of the rains.

An erect shrub, five, six, or even more feet high, with dichotomous, very little spreadi ash-coloured branches. *Branchlets* very slender and twiggy, hanging, green, with numer compressed widened joints, like all the other parts of the plant smooth. *Leaves* spreadi from five to seven inches long and almost as many times exceeding their interstices, an i I. or less broad a little above their acute base, from thence tapering into a sharp acumen, opa 388 and somewhat glaucous above, pale beneath, with a slender white rib and very fine sub-op site nearly transversal nerves which communicate with each other in sub-marginal arch *Petioles* about two lines long, channelled. *Stipules* adpressed, lanceolate, as broad as t interstices between the insertion of the two opposite leaves, tapering into a subulate poi which generally exceeds the petioles in length. *Corymb* small, supported by a pair of v short leaves, consisting of twice or thrice trichotomous, reddish, pubescent peduncles, wi opposite linear, subulate bractes under each division, having a stipuliform, fimbriated proc between their bases. *Pedicels* ternate or fascicled, two or three lines long, with three pairs reddish fleshy subulate scales, the uppermost adpressed to the calyx. *Calyx* very small, oblon reddish, with erect subulate teeth; at the bottom, within, there is a series of fleshy, subulat withering and sphacelated *ciliæ* as in the family of *Asclepiadeæ* and *Apocyneæ*. *Corol* white; *tube* slender, half an inch long; *limb* spreading, equalling the tube, with linear oblon falcate, slightly pubescent *laciniæ*. *Anthers* linear and long, the base bifid and ending in tw whitish processes. *Filaments* short, exserted. *Style* clavate. *Stigma* two-lobed, subulat spreading, elevated above the mouth of the corolla. *Berry* as large as a marrow-fat pea, re smooth, crowned with the four subulate, erect teeth of the calyx. *Seeds* cup-shaped, hemisph rical.

PYROSTRIA. Juss. gen. ed. Ust. 229.

Calyx four-toothed. *Corol* with cylindric tube, and four-cleft border. *Drupe* inferio with as far as eight, one-seeded nuts.

1. P. *hexasperma. R.*

Leaves opposite, short-petioled, oblong, acute, entire. *Corymbs* axillary, and also withi I. the cuspidate, hairy, stipules, dichotomous. *Drupe* six-seeded.
389 A native of the Island of Honimoa.

Tender shoots clothed with brown hairs. *Leaves* opposite, approximate, short-petioled oblong, acute, entire, a little hairy; from three to four inches long. *Stipules* within th leaves cuspidate, hairy. *Peduncles* opposite; with the stipules many times longer than th petioles, each ending in a small twice dichotomous, corymbiform, panicle of recurved secun spikes. *Bractes* subulate, one-flowered. *Flowers* rather small, hairy. *Calyx* four-toothed *Corol* with a slender, cylindric, villous tube, and contracted, four-parted border. *Filament* none. *Anthers* linear in the mouth of the tube of the corol, and affixed to it by their back *Germ* beneath. *Style* shorter than the corol. *Stigma* simple. *Drupe* round, six-ribbed size of a pea. *Seeds* or nuts regularly six, sub-cylindric.

SALVADORA. Schreb. gen. N. 220.

Calyx four-toothed. *Corol* one-petioled, four-cleft. *Style* none or short. *Berry* in ferior, one-seeded.

1. S. *persica. Linn. sp. pl. ed. Willd.* i. 695. *R. Corom. pl.* i. *N.* 26.

Rivina *paniculata. Syst. nat.* x. *p.* 899.

Teling. Pedda-warago-wenki.

A middle sized tree, a native of most parts of the Circars, though by no means common it seems to grow equally well in every soil. Produces flowers and ripe fruit all the yea round.

Trunk generally crooked, from eight to ten feet high to the branches, and one in diame ter. *Bark* very scabrous, and deeply cracked. *Branches* exceedingly numerous, spreading with their extremities perfectly pendulous, like the *weeping willow*. *Leaves* opposite, petioled I. oval or oblong, entire, very smooth, and shining on both sides, without veins; from one t 390 two inches long, and about one broad. *Stipules* none. *Panicles* terminal, and from the ex terior axills. *Flowers* minute, very numerous, greenish-yellow. *Bractes* minute. *Calyx* in ferior, four-toothed, permanent. *Corol* one-petalled. *Tube* short, border four-cleft; *segment*

oblong, revolute. *Filaments* four, inserted into the tube of the corol under its fissures, and rather shorter than the border. *Anthers* oval. *Germ* globular, style none. *Stigma* scabrous. *Berry* very minute, much smaller than a grain of black pepper, smooth, red, juicy. *Seed* one. Page Carey Ed.

Obs. The berries have a strong aromatic smell, and taste much like garden cresses. The bark of the root is remarkably acrid, bruised and applied to the skin, soon raises blisters, for which purpose the natives often use it. As a stimulant it promises to be a medicine possessed of very considerable powers.

CALLICARPA. Schreb. gen. N. 175.

Calyx four-toothed. *Corol* one-petalled, tubular, four-parted. *Germ* four-celled, cells one-seeded; *ovula* attached to the middle of the axis. *Berry* four-seeded. *Embryo* erect, and furnished with a perisperm.

1. C. *arborea. R.*

Arboreous. *Leaves* long-petioled, oblong, ventricose, tapering much toward both ends, entire, hairy underneath. *Panicles* axillary, sub-globular, throughout dichotomous.

A stout tall tree; a native of Chittagong. Flowers at various times through the year.

Trunk nearly erect, and in trees nine years old, thirty-three inches in circumference four feet above the surface of the soil. *Branches* spreading. *Branchlets* obtusely four-cornered, and mealy. *Leaves* opposite, long-petioled, oblong, ventricose, tapering equally at each end, entire, smooth above, hairy underneath, while young and unexpanded very mealy on both sides; length from six to twelve inches, petiole included, which may be reckoned one-fourth of the whole. *Panicles* axillary, solitary, or paired, the largest on a peduncle as long as the petioles, sub-rotund, from six or eight times dichotomous, all the ramifications somewhat four-cornered and mealy. *Flowers* small, very numerous, lively purple, or lilac, small, rather offensive. *Bractes* minute. *Calyx* campanulate, obscurely four-toothed, mealy on the outside. *Corol* with the tube much longer than the calyx, one of the segments of its border smaller. *Filaments* twice the length of the corol. *Anthers* brown. *Germ* superior, round, four-celled, with one ovulum in each, attached to the middle of the axis. *Style* as long as the stamens, and bent in an opposite direction. *Stigma* headed. *Berry* superior, round, polished, lively purple, succulent, size of a small grain of black pepper; one-celled. *Seeds* four, convex on the outside, with two flat faces on the inner, rough; *interior* integument hard like the shell of a nut. *Perisperm* oval, soft, amygdaline. *Embryo* straight, erect, nearly as long as the perisperm. *Cotyledons* oblong. *Radicle* oblong, the length of the cotyledons, inferior. I. 391

2. C. *lanata. Linn. sp. pl. ed. Willd.* i. 620.

Arboreous, all the young parts mealy. *Leaves* opposite, oval, entire, downy. *Corymbs* axillary, dichotomous throughout. *Corols* oblique.

Tomex tomentosa. *Flor. Zeyl. N.* 59.

A pretty large tree, a native of the Circar mountains, and of the vallies between them.

Trunk perfectly straight, and of a considerable height. *Bark* smooth, ash-coloured. *Branches* few, and near the top, forming but a small head for so large a trunk. *Young shoots* somewhat four-sided, and covered with gray farina. *Leaves* opposite, petioled, ovate, tapering to a point, entire, downy, below whitish with much down; from nine to ten inches long, and five or six broad. *Petioles* round, two or three inches long, covered with down. *Corymbs* axillary, erect, two-forked throughout; every part covered with gray farina. *Bractes* small. *Flowers* very numerous, small, purple. *Calyx* short; border four-sulcated, permanent. *Corol, tube* bent to one side. The other parts as in the genus. *Style* descending. I. 392

Obs. The wood of this tree is white, spongy, and of course not fit for much use.

3. C. *cana. Linn. sp. pl. ed. Willd.* i. 620.

Shrubby, downy. *Leaves* ovate, glandular-dentate-serrate, downy underneath. *Panicles* axillary, sub-globular. *Stigma* bifid. *Berries* purple.

Callicarpa americana. Louriero. Cochin Ch. ed. Willd. i. *p.* 88.

This shrub was introduced into the Botanic garden from the Moluccas in 1798, and in three years had attained to the height of from four to eight feet high, considerably ramous, with the young parts downy, and the ligneous ones covered with smooth, pale ash-coloured bark. They are in blossom in March and April chiefly, though more or less the whole year.

Leaves opposite, short petioled, from broad cordate to oblong, reticulated with margins glandular-dentate-serrate; upper side soft and of a deep green colour, but very downy, and pale underneath. *Cymes* axillary, dichotomous, scarcely longer than the petioles, villous. *Flowers* numerous, small, pale red colour. *Bractes* subulate, caducous. *Calyx* woolly, four-toothed. *Corol* campanulate; divisions sub-cordate. *Filaments* longer than the corols, and inserted into the base of its tube, ascending. *Style* declined, length of the filaments. *Stigma* two-cleft. *Berry* small, round, smooth, deep purple. *Seeds* four.

Obs. It differs from C. *americana, Willd.* in having a woolly, toothed calyx, two-lobed stigma and in the form of the leaves. I. 393

4. C. *incana. R.*

Shrubby, young shoots hoary. *Leaves* lanceolate, obtusely serrulate, fine and entire-pointed, hoary underneath.

Mashandari. *Asiat. Res.* iv. 233.

Beng. Muttura, Muttrunja.

A erect shrub, with all the tender parts and the under surface of the leaves densely clothed with long, soft, white, stellate pubescence; common in the vicinity of Calcutta, where

Page Carey Ed. *Segments* of its border oblong, obtuse, and longer than the erect style, or stamina.

A native of the Moluccas, and with flowers infinitely more delicate than I. *fulgens* which it most resembles.

16. I. *congesta. R.*

Shrubby. *Leaves* short-petioled, oblong, strongly veined. *Corymbs* terminal, short, dense. *Flowers* sub-sessile. *Segments* of the calyx obscurely reniform; those of the border of the corol oblong, and obtuse.

A native of the Moluccas, and differs from I. *fulgens* in the firm somewhat coriaceous leaves, with stronger parallel veins.

17. I. *lanceolaria. Colebr.*

Shrubby, smooth; *branches* slender, pendulous, sub-dichotomous. *Leaves* in approximate pairs, very long, linear-lanceolate, acuminate, short-petioled. *Corymb* terminal, sub-sessile, small, with coloured scaly, crowded *peduncles*. *Tube* of the corol filiform; *laciniæ* linear-oblong. *Anthers* linear, with deeply bifid base.

A native of Travancore. Introduced into the Botanic garden by Dr. A. Berry in 1803. Time of blossoming the hot season; the fruit ripens towards the close of the rains.

An erect shrub, five, six, or even more feet high, with dichotomous, very little spreading, ash-coloured branches. *Branchlets* very slender and twiggy, hanging, green, with numerous compressed widened joints, like all the other parts of the plant smooth. *Leaves* spreading, from five to seven inches long and almost as many times exceeding their interstices, an inch
I. or less broad a little above their acute base, from thence tapering into a sharp acumen, opaque
388 and somewhat glaucous above, pale beneath, with a slender white rib and very fine sub-opposite nearly transversal nerves which communicate with each other in sub-marginal arches. *Petioles* about two lines long, channelled. *Stipules* adpressed, lanceolate, as broad as the interstices between the insertion of the two opposite leaves, tapering into a subulate point which generally exceeds the petioles in length. *Corymb* small, supported by a pair of very short leaves, consisting of twice or thrice trichotomous, reddish, pubescent peduncles, with opposite linear, subulate bractes under each division, having a stipuliform, fimbriated process between their bases. *Pedicels* ternate or fascicled, two or three lines long, with three pairs of reddish fleshy subulate scales, the uppermost adpressed to the calyx. *Calyx* very small, oblong, reddish, with erect subulate teeth; at the bottom, within, there is a series of fleshy, subulate, withering and sphacelated *ciliæ* as in the family of *Asclepiadeæ* and *Apocyneæ*. *Corolla* white; *tube* slender, half an inch long; *limb* spreading, equalling the tube, with linear oblong-falcate, slightly pubescent *laciniæ*. *Anthers* linear and long, the base bifid and ending in two whitish processes. *Filaments* short, exserted. *Style* clavate. *Stigma* two-lobed, subulate, spreading, elevated above the mouth of the corolla. *Berry* as large as a marrow-fat pea, red, smooth, crowned with the four subulate, erect teeth of the calyx. *Seeds* cup-shaped, hemispherical.

PYROSTRIA. Juss. gen. ed. Ust. 229.

Calyx four-toothed. *Corol* with cylindric tube, and four-cleft border. *Drupe* inferior, with as far as eight, one-seeded nuts.

1. P. *hexasperma. R.*

Leaves opposite, short-petioled, oblong, acute, entire. *Corymbs* axillary, and also within
I. the cuspidate, hairy, stipules, dichotomous. *Drupe* six-seeded.
389 A native of the Island of Honimoa.

Tender shoots clothed with brown hairs. *Leaves* opposite, approximate, short-petioled, oblong, acute, entire, a little hairy; from three to four inches long. *Stipules* within the leaves cuspidate, hairy. *Peduncles* opposite; with the stipules many times longer than the petioles, each ending in a small twice dichotomous, corymbiform, panicle of recurved secund spikes. *Bractes* subulate, one-flowered. *Flowers* rather small, hairy. *Calyx* four-toothed. *Corol* with a slender, cylindric, villous tube, and contracted, four-parted border. *Filaments* none. *Anthers* linear in the mouth of the tube of the corol, and affixed to it by their backs. *Germ* beneath. *Style* shorter than the corol. *Stigma* simple. *Drupe* round, six-ribbed; size of a pea. *Seeds* or nuts regularly six, sub-cylindric.

SALVADORA. Schreb. gen. N. 220.

Calyx four-toothed. *Corol* one-petioled, four-cleft. *Style* none or short. *Berry* inferior, one-seeded.

1. S. *persica. Linn. sp. pl. ed. Willd.* i. 695. *R. Corom. pl.* i. *N.* 26.

Rivina *paniculata. Syst. nat.* x. *p.* 899.

Teling. Pedda-warago-wenki.

A middle sized tree, a native of most parts of the Circars, though by no means common; it seems to grow equally well in every soil. Produces flowers and ripe fruit all the year round.

Trunk generally crooked, from eight to ten feet high to the branches, and one in diameter. *Bark* very scabrous, and deeply cracked. *Branches* exceedingly numerous, spreading, with their extremities perfectly pendulous, like the *weeping willow*. *Leaves* opposite, petioled,
I. oval or oblong, entire, very smooth, and shining on both sides, without veins; from one to
390 two inches long, and about one broad. *Stipules* none. *Panicles* terminal, and from the exterior axills. *Flowers* minute, very numerous, greenish-yellow. *Bractes* minute. *Calyx* inferior, four-toothed, permanent. *Corol* one-petalled. *Tube* short, border four-cleft; *segments*

oblong, revolute. *Filaments* four, inserted into the tube of the corol under its fissures, and rather shorter than the border. *Anthers* oval. *Germ* globular, style none. *Stigma* scabrous. *Berry* very minute, much smaller than a grain of black pepper, smooth, red, juicy. *Seed* one. Page Carey Ed.

Obs. The berries have a strong aromatic smell, and taste much like garden cresses. The bark of the root is remarkably acrid, bruised and applied to the skin, soon raises blisters, for which purpose the natives often use it. As a stimulant it promises to be a medicine possessed of very considerable powers.

CALLICARPA. Schreb. gen. N. 175.

Calyx four-toothed. *Corol* one-petalled, tubular, four-parted. *Germ* four-celled, cells one-seeded ; *ovula* attached to the middle of the axis. *Berry* four-seeded. *Embryo* erect, and furnished with a perisperm.

1. C. *arborea. R.*

Arboreous. *Leaves* long-petioled, oblong, ventricose, tapering much toward both ends, entire, hairy underneath. *Panicles* axillary, sub-globular, throughout dichotomous.

A stout tall tree ; a native of Chittagong. Flowers at various times through the year.

Trunk nearly erect, and in trees nine years old, thirty-three inches in circumference four feet above the surface of the soil. *Branches* spreading. *Branchlets* obtusely four-cornered, and mealy. *Leaves* opposite, long-petioled, oblong, ventricose, tapering equally at each end, entire, smooth above, hairy underneath, while young and unexpanded very mealy on both sides ; length from six to twelve inches, petiole included, which may be reckoned one-fourth of the whole. *Panicles* axillary, solitary, or paired, the largest on a peduncle as long as the petioles, sub-rotund, from six or eight times dichotomous, all the ramifications somewhat four-cornered and mealy. *Flowers* small, very numerous, lively purple, or lilac, small, rather offensive. *Bractes* minute. *Calyx* campanulate, obscurely four-toothed, mealy on the outside. *Corol* with the tube much longer than the calyx, one of the segments of its border smaller. *Filaments* twice the length of the corol. *Anthers* brown. *Germ* superior, round, four-celled, with one ovulum in each, attached to the middle of the axis. *Style* as long as the stamens, and bent in an opposite direction. *Stigma* headed. *Berry* superior, round, polished, lively purple, succulent, size of a small grain of black pepper; one-celled. *Seeds* four, convex on the outside, with two flat faces on the inner, rough; *interior* integument hard like the shell of a nut. *Perisperm* oval, soft, amygdaline. *Embryo* straight, erect, nearly as long as the perisperm. *Cotyledons* oblong. *Radicle* oblong, the length of the cotyledons, inferior. I. 391

2. C. *lanata. Linn. sp. pl. ed. Willd.* i. 620.

Arboreous, all the young parts mealy. *Leaves* opposite, oval, entire, downy. *Corymbs* axillary, dichotomous throughout. *Corols* oblique.

Tomex tomentosa. *Flor. Zeyl. N.* 59.

A pretty large tree, a native of the Circar mountains, and of the vallies between them.

Trunk perfectly straight, and of a considerable height. *Bark* smooth, ash-coloured. *Branches* few, and near the top, forming but a small head for so large a trunk. *Young shoots* somewhat four-sided, and covered with gray farina. *Leaves* opposite, petioled, ovate, tapering to a point, entire, downy, below whitish with much down; from nine to ten inches long, and five or six broad. *Petioles* round, two or three inches long, covered with down. *Corymbs* axillary, erect, two-forked throughout; every part covered with gray farina. *Bractes* small. *Flowers* very numerous, small, purple. *Calyx* short; border four-sulcated, permanent. *Corol, tube* bent to one side. The other parts as in the genus. *Style* descending. I. 392

Obs. The wood of this tree is white, spongy, and of course not fit for much use.

3. C. *cana. Linn. sp. pl. ed. Willd.* i. 620.

Shrubby, downy. *Leaves* ovate, glandular-dentate-serrate, downy underneath. *Panicles* axillary, sub-globular. *Stigma* bifid. *Berries* purple.

Callicarpa americana. Louriero. Cochin Ch. ed. Willd. i. *p.* 88.

This shrub was introduced into the Botanic garden from the Moluccas in 1798, and in three years had attained to the height of from four to eight feet high, considerably ramous, with the young parts downy, and the ligneous ones covered with smooth, pale ash-coloured bark. They are in blossom in March and April chiefly, though more or less the whole year.

Leaves opposite, short petioled, from broad cordate to oblong, reticulated with margins glandular-dentate-serrate; upper side soft and of a deep green colour, but very downy, and pale underneath. *Cymes* axillary, dichotomous, scarcely longer than the petioles, villous. *Flowers* numerous, small, pale red colour. *Bractes* subulate, caducous. *Calyx* woolly, four-toothed. *Corol* campanulate; divisions sub-cordate. *Filaments* longer than the corols, and inserted into the base of its tube, ascending. *Style* declined, length of the filaments. *Stigma* two-cleft. *Berry* small, round, smooth, deep purple. *Seeds* four.

Obs. It differs from C. *americana, Willd.* in having a woolly, toothed calyx, two-lobed stigma and in the form of the leaves.

4. C. *incana. R.* I. 393

Shrubby, young shoots hoary. *Leaves* lanceolate, obtusely serrulate, fine and entire-pointed, hoary underneath.

Mashandari. *Asiat. Res.* iv. 233.

Beng. Muttura, Muttrunja.

A stout shrub, with all the tender parts and the under surface of the leaves densely clothed with long, soft, white, stellate pubescence; common in the vicinity of Calcutta, where

Page Carey Ed. it is in flower and seed nearly the whole year.

I long considered this to be Vahl's *macrophylla*, but on rearing what I also took for the same species from Silhet and Chittagong, in the Botanic garden, I could plainly observe a striking difference when growing near each other, and as the Chittagong and Silhet sort agrees much better with Vahl's figure and description, I must consider it to be his *macrophylla*. In the Calcutta plant, which I now call *incana*, the leaves are never so broad in proportion to their length, more round at the base; much more pointed, with the long taper points entire; all the rest of the margin, except what may be called the base, obtusely serrulate. In *macrophylla*, the leaves are crenate, more obtuse, and the margins cut to the very apex; the two are however very nearly allied, though I think sufficiently distinct to authorize their being considered as different.

5. C. *macrophylla. Vahl. Symbol.* iii. 13. *t.* 53.

Shrubby, downy. *Leaves* opposite, ovate lanceolate, serrulate, reticulate, hoary underneath. *Corymbs* axillary, dichotomous, rather longer than the petioles. *Berry* minute white.

A native of Silhet and Chittagong.

A shrub, from four to eight feet in length. *Trunk* scarcely any, but several, round, erect branches, covered with white down. *Leaves* opposite, petioled, lanceolate, or oblong lanceo-
I. late, fine-pointed, finely serrate, wrinkled, above soft, and a little downy, below covered with
394 much whitish soft down, from six to nine inches long, and two or three broad. *Stipules* none. *Petioles* about an inch long, downy, many times shorter than the leaves. *Peduncles* as long as the petioles, round, downy. *Bractes* lanceolate, one under each division of the corymb. *Flowers* very numerous, small, rose-coloured. *Calyx* woolly, the four divisions distinct and acute.

6. C. *acuminata. R.*

Shrubby, tender parts hoary with a stellate pubescence. *Leaves* broad-lanceolar, acuminate, remotely repand, denticulate. *Panicles* axillary, long-peduncled, dichotomous, shorter than the leaves.

A native of Silhet, flowers in May. In this species the panicles are elevated on longer peduncles than in the other species, the leaves and young parts hairy, except the upper surface of the former when fully expanded, which is then naked and reticulate; from four to five inches long by nearly two broad.

7. C. *longifolia. Linn. sp. pl. ed. Willd.* i. 621.

Shrubby, with erect weak branches. *Leaves* rather long-petioled, broad-lanceolate, serrulate, smooth above, downy underneath. *Panicles* axillary, dichotomous, length of the petioles. *Berries* white.

A native of Prince Wales' Island, where it blossoms in June, July, and August.

8. C. *cuspidata. R.*

Shrubby, all the tender parts, and the under surface of the short-petioled, elliptic, dentate, cuspidate *leaves* woolly. *Corymbs* axillary, their division and the calyces clothed with minute grains under the wool.

A native of the Moluccas; the leaves are always acutely dentate, and end in a long
I. taper, acute point. The berries are very small, smooth, and purple.
395 9. *C. lanceolaria. R.*

Shrubby, hairy. *Leaves* lanceolar, serrulate, acuminate. *Panicles* axillary, short-peduncled, sub-globular. *Berries* white.

H. *Koamoora.*

A pretty, shrubby species, with narrower leaves than any of the other species I have yet met with in India, they taper most toward the base, are nearly smooth on the upper surface, but very hoary underneath; as are all the other tender parts. *Flowers* numerous, minute, purple.

A native of the forests of Silhet, where it is in flower most part of the year.

10. C. *pentandra. R.*

Shrubby, tender parts mealy. *Leaves* opposite, with an alternate one between, oblong entire, cuspidate. *Corymbs* axillary. *Flowers* pentandrous. *Stigma* from three to four-lobed.

A native of the Moluccas.

11. C. *purpurea. Juss.*

Shrubby; *branchlets* and younger parts slightly scaly. *Leaves* sub-sessile, lanceolate, acuminate, serrate, with sub-entire cuneate base, smooth above, glandular-dotted below. *Corymbs* axillary, very small, dichotomous. *Flowers* glandular.

Porphyra dichotoma. Lour. Cochin Ch. ed. Willd. i. 87.

A native of China. Introduced in 1812, into the Botanic garden, at Calcutta, where it thrives extremely well, has attained a height of from four to six feet, and blossoms from April to September. The berries ripen at the close of the rainy season.

Shrubby, spreading, with roundish branches, covered with scabrous gray bark. *Branch-*
I. *lets* very slender, slightly scabrous, and beset with ferruginous stellate and somewhat scaly
396 pubescence; new shoots almost mealy. *Leaves* from lanceolate to oval, two inches long, tapering at both ends, but more so at the base, and only there entire: the rest of the margin serrulate; without any hair or down, but scabrous below, from a great number of minute brown shining glandular dots which impart on being rubbed, a faintly aromatic smell; nerves and ribs elevated and slightly scaly. *Petioles* very short. *Corymbs* axillary or rather supra-axillary, small, round, two or three times dichotomous, many times shorter than the leaves; *peduncles* short, divaricate, beset with mealy pubescence, with minute lanceolate scales under each subdivision.

Flowers fragrant, purple, marked with glandular dots. *Calyx* turbinate with very small obtuse teeth. *Corol* about three times longer than the calyx, infundibuliform; *laciniæ* oval, obtuse. *Filaments* almost twice as long as the corolla, purple; *anthers* large, orange-coloured, covered with many glandular dots. *Stigma* sub-capitate, elevated about the anthers. *Berry* very small, purple, at last red, with one or two fertile seeds. Page Carey Ed.

BUDDLEIA. Schreb. gen. N. 184.

Calyx four-cleft. *Corol* four-cleft. *Capsule* superior, bisulcate, bilocular. *Seeds* numerous.

1. B. *Neemda*, Buchanan.

Arborescent. *Leaves* lanceolate, sub-serrate, hoary underneath. *Spikes* terminal, lengthening, with *flowers* three-fold.

Nimda the vernacular name at Chittagong, where the plant is indigenous, and from thence introduced into the Botanic garden by Dr. Buchanan, where it begins to blossom about the close of the cold season. Seeds ripen in March and May.

Trunk erect; *branches* numerous, opposite. *Bark* of the longer woolly parts ash-coloured; *young shoots* covered with white down. Height of the tree, in two years, about fifteen feet. *Leaves* opposite, short-petioled, lanceolate, slightly hairy; from four to eight inches long. *Petioles* short, their bases joined by a connecting membrane. *Spikes* terminal, generally three-fold, there being a larger, and longer in the centre, with a smaller on each side; long, slender, hairy, lengthening, and blossoming for three months. *Flowers* generally three-fold, sub-opposite, sessile, very numerous, small, pure white, and of a pleasant smell. *Bractes* lanceolate, one under each flower. *Calyx* inferior, four, rarely five-toothed, villous. *Corol* one-petalled, hypocrateriform. *Tube* the length of the calyx; mouth villous, border of four, rarely five, rounded, equal segments. *Filaments* short, inserted near the base of the tube of the corol. *Anthers* broad, sagittate, hid in the tube. *Germ* conical. *Style* short. *Stigma* large, oblong, bisulcate, even with the tops of the anthers. *Capsule* ovate-oblong, two-celled, two-valved. *Seeds* minute, numerous, imbricated, compressed. I. 397

Obs. The whiteness of the leaves, and young shoots of this plant, independently of its numerous, beautiful, small, fragrant, pure white flowers, makes it highly ornamental, particularly amongst plants with darker foliage.

EXACUM. Schreb. gen. N. 185.

Calyx four-leaved. *Corol* salver-shaped. *Capsule* superior, two-celled, two-valved. *Seeds* many.

1. E. *bicolor. R.*

Annual, erect, four-sided. *Leaves* sessile, ovate, five-nerved. *Flowers* axillary; *apices of the segments* of the corol blue, the rest white. *Anthers* erect.

A native of Cuttack, where it appears during the cool season.

Root almost simple. *Stem* erect, branchy, four-sided; angles somewhat winged, from one to two feet high. *Leaves* sub-sessile, opposite, oval, five-nerved, smooth, size very various. *Floral leaves* small and narrow. *Flowers* axillary, solitary, short-peduncled, large, of a beautiful white and blue colour. I. 398

2. E. *tetragonum. R.*

Annual, simple, erect, four-sided. *Leaves* sessile, lanceolate, five-nerved. *Flowers* numerous, terminal. *Stamens* and *style* declinate.

Beng. Koochuri.

A native of Bengal, where it grows among long grass; and flowers during the rains.

Stem erect, simple, exactly four-sided, smooth; from two to three or even four feet high. *Leaves* opposite, decussate, sessile, lanceolate, five-nerved, smooth and shining, from two to four inches long. *Flowers* terminal, numerous, large, of a most beautiful blue colour, inodorus. *Calyx* divided nearly to the base into four, daggered segments. *Corol*, segments oblong, acute, spreading. *Filaments* on the tube of the corol, short. *Anthers* linear, bending to one side, with two pores at the top, for the discharge of the pollen, as in Cassia. *Germ* oval. *Style* projecting obliquely with the stamina; *stigma* enlarged. *Capsule* two-celled, two-valved. *Seeds* numerous.

Obs. This is one of the most elegant plants I have met with, the flowers being not only numerous, large, and beautiful, but retaining their beauty and expansion for many days, which is a rare circumstance in an Indian plant.

3. E. *zeylanicum. R.*

Annual, pentandrous. *Leaves* opposite, sub-sessile, lanceolate, three-nerved. *Flowers* five-cleft. *Calyx* with five, broad membranaceous wings with subulate points.

Chironia trinervia. *Linn. sp. pl. ed. Willd.* i. 1065.

Lysimachia folio sinuato, acuminato trinervio, flore cœruleo, amplo calyce carinato, alato. *Burm. Zeyl. p.* 145. *t.* 67.

A native of Ceylon.

Stem erect, somewhat four-sided, smooth, annual. *Leaves* opposite, short-petioled, lanceolate, entire, smooth on the sides, three-nerved, from one to three inches long. *Racemes* terminal, and opposite from the exterior axills, the whole forming an expanded corymbiform panicle. *Peduncles* and *pedicels* four-sided, smooth. *Flowers* numerous, large, of a violet colour. *Calyx* five-cleft, divisions with a broad membranaceous wing, on the back, and a long I. 399

Page Carey Ed. subulate point. *Corol ; tube* gibbous, length of the calyx, some short filaments amongst the insertions of the stamina crown the mouth of the tube. *Border* of five, obovate, beautiful, violet-coloured divisions. *Filaments* on the mouth of the tube, erect. *Anthers* linear, with two pores at the top, and also opening on the sides. *Style* declining, rather longer than the filaments. *Stigma* headed. *Capsule* oblong, two-celled.

Obs. The anthers remain straight, and hard, with two pores at the top, and also bursting by two longitudinal openings on the sides, I have for that reason removed this plant from the genus *Chironia*, the essential mark of which consists in its spiral anthers.

4. E. *carinatum. R.*

Annual, erect. *Leaves* sub-sessile, lanceolate, three-nerved. *Corols* four-cleft. *Calyces* broad, membranaceo-carinated. *Stamens* protruded. *Style* declined.

A native of Ceylon.

Root ramous, annual. *Stem* erect, with one or two opposite pairs of branches about the middle ; above these dichotomous, somewhat four-sided, smooth, from six to twelve inches high. *Leaves* opposite, short-petioled, lanceolate, entire, three-nerved. *Flowers* terminal, numerous, pretty large, yellow, collected on dichotomous corymbs, with a long peduncled one in each of the divisions. *Calyx* four-parted, each division augmented by a broad membranaceous keel on the back. *Corol* four-parted. *Filaments* short, inserted on a membranaceous rim round the inside of the mouth of the tube. *Anthers* erect, yellow, opening on the sides.

I. *Style* longer than the stamens, declined. *Stigma* ascending, simple.

400 5. E. *sulcatum. R.*

Annual, erect, ramous, sulcated on the opposite sides of the stem and branches. *Leaves* sub-sessile, lanceolate, fleshy, three-nerved. *Calyx* with four ridges. *Stamens* erect. *Capsules* globular.

A native of Bengal ; blossoms during the cool season ; the seeds ripen in March.

Root fibrous, annual. *Stem* erect, from six to twelve inches high, smooth, sulcated on opposite sides. *Branches* opposite, their flower-bearing extremities two, and three times two-cleft. *Leaves* opposite, sub-sessile, lanceolate, fleshy, entire, three-nerved ; from one to two inches long. *Flowers* terminal, numerous, of a bright blue colour, those in the divisions of the branchlets long-peduncled. *Peduncles* four-sided. *Bractes* ovate, recurved. *Calyx* deeply four-parted ; divisions with an ample keel. *Filaments* short, inserted in the mouth of the tube of the corol. *Anthers* ovate, oblong, touching at the sides, apices perforated. *Style* longer than the stamens, declined; stigma two-lobed. *Capsule* globular, two-celled, two-valved. *Seeds* numerous.

Obs. This is a very beautiful small plant.

PLADERA. Solander's Mss.

Calyx cylindric, four-toothed. *Corol* funnel-shaped, border irregular. One of the *stamina* larger. *Stigma* two-lobed. *Capsule* superior, one-celled, two-valved. *Seeds* numerous.

1. P. *sessiliflora. R.*

Annual, erect, four-sided ; *angles* winged. *Leaves* opposite, sessile, ovate, entire. *Flowers* sessile.

Exacum heteroclitum. *Linn. sp. pl. ed. Willd.* i. *p.* 639.

Gentiana heteroclita. *Mant.* 560.

A native of Coromandel and Bengal, appears on moist pasture ground during the rains

I. and first part of the cool season.

401 *Stem* erect, with two or three pairs of opposite branches, which are again once or oftener dichotomous, all are four-sided, with a thin wing to each angle ; height of the whole plant about a span. *Leaves* opposite, sessile, ovate, entire, three-nerved ; differing much in size, the largest rarely an inch long. *Flowers* solitary, in the divisions of the plant, sessile, small, pale red. *Calyx* sub-cylindric, four-toothed; teeth acute. *Corol* with the tube as long as the calyx. *Border* three-cleft, two of the divisions equal, oblong, and crowded at the apex, the third divided half way down. *Filaments* four; three longer, and inserted in the mouth of the tube; the fourth just below the fissure of the bifid segments of the corol. *Anthers* equal, oblong. *Germ* linear-oblong. *Style* as long as the stamina. *Stigma* two-lobed ; *lobes* large, obovate, thin. *Capsule* sub-cylindric, nearly as long as the permanent *calyx*, and hid in it, one-celled, two-valved. *Receptacles* consist in the incurved margins of the valves, (parietal, and two-lobed.) *Seeds* numerous, angular, very small.

2. P. *virgata. R.*

Annual, erect, four-sided, branches opposite, alternate. *Leaves* sessile, lanceolar, three-nerved. *Flowers* terminal, sub-panicled.

Exacum diffusum. *Linn. sp. pl. ed. Willd.* i. 637.

Gentiana diffusa. *Vahl. Symbol.* iii. 47.

A beautiful erect, ramous annual; growing on the banks of water courses, and on low fallow lands. Flowering time the wet season.

Stem about a foot, or sometimes two feet high, erect, four-sided, ramous, smooth ; inferior branches opposite, above alternate, very slender and twiggy. *Leaves* opposite, sessile, the lower lanceolate, the upper broader, all are pointed, and three-nerved, entire, smooth ; size various. *Flowers* numerous, terminal, peduncled, small, rose-coloured. *Calyx* four-toothed,

I. permanent. *Corol* funnel-shaped. *Border* irregular, three-parted ; the two upper segments

402 equal, and orbicular, the lower one two-parted ; with a deep groove ; in the groove is lodged the fourth or large stamen. *Filaments* four, inserted into the mouth of the tube, the lower-

most longer than the other three, and bearing an orange-coloured, and longer *anther*, which when shedding its pollen, is bent over the fissure of the *stigma*; anthers of the other three filaments equal, pale yellow. *Style* single, length of the short filaments. *Stigma* two-cleft, segments recurved. *Capsule* one-celled, many-seeded. Page Carey Ed.

3. P. *decussata. R.*

Annual, erect, four-winged, branches crossed-armed. *Leaves* ovate-lanceolate, three-nerved. *Flowers* terminal, three-fold, peduncled.

Beng. Dunkoni.

This species resembles P. *virgata*, but is a little more robust, and seldom so high. It is a native of the same places. Flowering time the same.

Stem about a foot high, perfectly erect, four-sided; *angles* very sharp, or rather membrane-winged, smooth, ramous, branches always opposite, cross-armed, in other respects like the stem. *Leaves* opposite, spreading, sessile, lanceolate, sharp-pointed, entire, smooth, three-nerved, size various. *Flowers* terminal, and axillary, peduncled, the terminal flowers three-fold; the axillary single, larger than those of the last species, and white. *Peduncles* four-sided, like the stem and branches. *Calyx* large, four-toothed, four-sided, four-winged. *Corol, stamens*, &c. exactly as in the last species.

4. P. *perfoliata. R.*

Annual, erect, four-winged. *Cauline* leaves lanceolate, three-nerved; *floral* leaves (or bractes) perfoliate.

Canscora. *Lamarck's Encyclop. Bot.* i. 601.

Cansjan-Cora. *Rheed. Mal.* x. *p.* 103. *t.* 52.

A native of India, where it delights in a low moist soil. Flowering time the rainy season. I. 403

Root ramous, annual. *Stem* erect, somewhat four-sided, with four broad membranaceous wings. *Branches* opposite, and like the stem; all are smooth. Height of the whole plant about eighteen inches. *Leaves* of the stem opposite, sessile, lanceolate, three-nerved. *Floral* leaves perfoliate, all smooth and entire. *Flowers* terminal, peduncled, numerous, pretty large, pale rose colour. *Calyx* four-toothed, striated, permanent. *Corol* irregular, somewhat two-lipped; the upper one larger and deeply two-parted, the lower one consisting also of two lobes, but smaller. *Filaments* four, three of them rather shorter, and inserted on the upper side of the tube; the third larger, and inserted below the fissure of the lower lip. *Anthers* oblong. *Style* as long as the stamens. *Stigma* two-parted. *Segments* recurved. *Capsule* oblong, one-celled, two-valved.

5. P. *pusilla. R.*

Annual, from one to two inches high. *Leaves* sessile, subcordate. *Flowers* terminal, sessile, three-fold, monandrous. *Corol* hid in the calyx. *Capsule* globular.

Compare with Hopea dichotoma. *Vahl. enumer.* i. *p.* 3; also with *Exacum sessile. Willd.* i. 635.

A beautiful minute plant, a native of Coromandel.

Stem erect, four-sided, branchy; from one and a half to two inches high. *Branches* cross-armed. *Leaves* opposite, sessile, cordate, minute, smooth. *Flowers* terminal, sessile, three-fold, small, yellow. *Calyx* one-leaved, sub-cylindric, as long as the corol, four-toothed, permanent. *Corol* one-petalled. *Tube* a little gibbous, mouth four-toothed. *Filaments* four within the tube of the corol, and inserted into it near the base. *Anthers*, three minute, and abortive; one large and fertile. *Germ* globular. *Style* short. *Stigmas* two, globular. *Capsule* oval, covered by the calyx, one-celled, two-valved. *Seeds* numerous, black.

PLANTAGO. Schreb. gen. N. 186. I. 404

Calyx four-cleft. *Corol* four-cleft, with border reflexed. *Stamina* very long. *Capsule* superior, two-celled, cut transversely.

1. P. *Ispaghula. R. Fleming in Asiat. Res.* xi. 174.

Annual, caulescent. *Leaves* linear-lanceolar, three-nerved, slightly woolly. *Peduncles* axillary, naked, simple, length of the leaves; heads cylindric. *Capsules* two-celled.

Ispagool, the Hindee and Persian name, and that by which it is most generally known in Bengal and on the coast of Coromandel.

Native place uncertain, but it is cultivated during the cool season.

Root ramous, annual. *Stem*, if any, very short, soon dividing into three or four ascending, round, villous branches, which are a few inches in length. *Leaves* alternate, linear-lanceolate, three-nerved, luxuriant in young plants remotely denticulate, somewhat woolly, towards the base channelled, and stem-clasping; length from six to eight inches by a quarter or half an inch broad. *Peduncles* axillary, solitary, naked, erect, round, a little villous, the length of the leaves. *Spikes* solitary, terminal, before the flowers expand ovate, afterwards cylindric; when in seed about an inch or an inch and a half long and erect. *Flowers* numerous, imbricated, small, dull, white, withering. *Bractes* one-flowered, ovate, concave, with the keel green, and the sides membranaceous. *Calyx* four-leaved. *Leaflets* oblong, ovate, with broad membranaceous margins. *Corol; tube* gibbous. *Segments* ovate, acute. *Filaments* oblong, two-celled, four, much larger than the segments of the corol. *Germ* oblong, two-celled, with one seed in each, attached to the middle of the partition. *Style* rather longer than the corol. *Stigma* subulate, villous. *Capsule* circumscissa, ovate, two-celled. *Seeds* solitary, I. 405 ovate-elliptic, convex on the outside; concave on the inner. *Integument* single, rather thick, smooth, tough, and brown. *Perisperm* conform to the seed. *Embryo* sub-cylindric, erect. *Cotyledon* long, linear. *Radicle* inferior, one-fourth the length of the cotyledon.

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Obs. From the seeds a mucilaginous drink is prepared, and often prescribed by our medical gentlemen in India, where emollients are wanted. They are also used by the native practitioners in medicine, and are to be met with for sale in the bazars of India under the Persian name *Uspagool.*

CISSUS. Schreb. gen. N. 192.

Calyx four-toothed. *Corol* four-petalled. *Germ* two-celled; *ovula* two, erect. *Berry* superior, from one to four-seeded. *Embryo* erect, in the base of an ample perisperm.

1. C. *adnata. R.*

Leaves round-cordate, bristle serrate, acuminate. *Stipules* orbicular, adnate, with gibbous centre, and scariose margins. *Cymes* flat, flowers drooping.

A native of the country about Dacca, from thence the late Colonel Peter Murray sent it to the Botanic garden, where it thrives well, blossoms in May and June, and ripens its fruit in September.

Stem and large *branches* ligneous, climbing over trees to a considerable extent, young shoots round, a little downy and slightly furrowed. *Leaves* alternate, round-cordate, and often obliquely so, acuminate, bristle-serrate, the largest sometimes slightly repand; pretty smooth above, but downy underneath, particularly the veins, from two to six inches long, one-fourth less in breadth. *Peduncles* half the length of the leaves, downy. *Stipules* nearly oval, adnate, elevated, and of a deeper green in the middle; *margins* scariose, and brown. *Tendrils* opposite to the leaves where there is no cyme. *Cymes* opposite to the leaves, on
I. villous peduncles, as long as the petioles, very ramous, flat. *Flowers* numerous, small, droop-
406 ing. The germ has two cells, in each of which are two seeds attached from their lower end to the partition at the bottom of the cell. *Berry* succulent, size of a pea, when ripe black, and smooth, generally one-celled. *Seed* for the most part solitary, obovate, lower end pointed. *Integuments* two, exterior nuciform, and rugose; *inner* a very thin, white membrane, which adheres firmly to the perisperm. *Perisperm* conform to the seed, dull white, cartilaginous, divided by two fissures into three, nearly equal parts. *Embryo* scarcely half the length of the perisperm. *Cotyledons* reniform. *Radicle* oblong, inferior.

2. C. *vitiginea. Linn. sp. pl. ed. Willd.* i. 655.

Leaves cordate-serrate. *Cymes* decompound. *Berries* one or two-seeded.

Hind. and *Beng.* Guali-lata.

Teling. Maratta-tiga.

This species is a native of forests, mountains, and way sides in uncultivated places.

Trunk woolly, branchy, climbing over trees and shrubs to a great extent. *Tendril* opposite to the leaves, two-cleft. *Leaves* alternate, petioled, cordate, serrate, or dentate, pretty smooth on both sides, from four to six inches long, and from three to four broad. *Stipules* cordate. *Cymes* peduncled, leaf-opposed, more than compound. *Flowers* small, red. *Germ* superior, half immersed in the four-sided, fleshy nectary. *Berry* small, black, one or two-seeded.

3. C. *glauca. R.*

Leaves cordate, bristle-serrate, smooth. *Stipules* broad-sulcate. *Cymes* decompound. *Berries* one-seeded.

Schunambu Valli. *Rheed. Mal.* vii. *p.* 21. *t.* 11.

This species is still larger than the last, and a native of the same or similar places; the
I. shoots, the tendrils, petioles and peduncles are all quite smooth and somewhat glaucous,
407 which does not admit of my considering it to be either *repanda,* or *latifolia.*

Tendrils leaf-opposed, undivided. *Leaves* alternate, petioled, broad-cordate, more or less acuminate, sometimes when large slightly lobed, bristle-serrate, smooth, from four to eight inches each way. *Stipules* broad-fulcate, apex rounded, caducous. *Cymes* with from three to five primary branches; ultimate divisions umbelliferous. *Berry* nearly round, size of a pea, smooth, succulent, purple, rarely more than one-seeded. *Seed* obovate. *Integument* a double membrane, with a spongy silver-coloured substance between. *Perisperm* and *embryo* as in the genus.

4. C. *cordata. R.*

Shrubby, scandent, smooth. *Leaves* cordate, slightly and remotely bristle-serrulate. *Cymes* compound, leaf-opposed.

Meriam-Pulli. *Rheed. Mal.* vii. *p.* 91. *t.* 48.

Funis crepitans major. *Rumph. Amb.* v. *p.* 446. *t.* 164. *f.* 1.

A native of Amboyna, from thence introduced into the Botanic garden, in 1796-7. Flowering time in Bengal, the rainy season.

Stem and *branches* long, slender, climbing over bushes to a considerable extent. *Bark* smooth; on the young parts polished and purplish. *Leaves* alternate, petioled, cordate, remotely and slightly serrulate, serratures acute, both sides smooth, length from four to six inches. *Tendrils* leaf-opposed, simple, coloured. *Stipules* adjoined, oval, coloured. *Cymes* leaf-opposed, first divisions trichotomous. *Flowers* small, dull purple. Taste of the leaves very acrid, and continuing long.

5. C. *quadrangularis. Willd. spec.* i. *p.* 657.

Perennial, scandent, jointed, four-winged. *Leaves* reniform-cordate, serrate. *Berries* spherical, one-seeded.

Beng. Harjora.

Funis quadrangularis. *Rumph. Amb.* v. *p.* 83. *t.* 44. *f.* 2.

This plant is one of the most common over every part of India; blossoms during the rains; and ripens its seed in the cool season. 408

Root fibrous. *Stem* and branches perennial, scandent, and often of very great length, smooth, succulent, jointed, contracted at the joints, four-winged, wings large, and sharp, young parts succulent, tender, and very smooth. These are very generally eaten by the natives in their curries. *Leaves* alternate, one at each joint, short-petioled, reniform, cordate, serrulate-dentate, smooth on both sides, an inch or an inch and a half each way. *Stipules* lunulate, entire. *Tendrils* solitary, simple, leaf-opposed. *Umbels* solitary, opposite to the leaves, occupying the place on which the tendril would otherwise grow, compound. *Umbellets* generally three or four, sub-globular. *Involucre* and *involucels* scarcely any. *Germ* ovate, immersed in the nectary, two-celled, with two ovula in each, attached to the bottom of the partition; *style* short. *Stigma* simple. *Berry* round, size of a small pea, smooth, red, succulent, one-celled. *Seed* solitary, obovate, covered with a double, dark brown, spongy integument. *Perisperm* conform to the seed, a double, dark-coloured fissure runs down the middle. *Embryo* small, erect, lodged on one side of the bottom of the double fissure just mentioned. *Cotyledons* with minute points. *Radicle* oblong, inferior.

6. C. *pentagona. R.*

Young shoots lucid, with five rounded angles and grooved sides. *Leaves* cordate, rarely sub-lobate, serrulate, acuminate, smooth.

An extensive perennial climber, a native of the forests of Chittagong.

7. C. *angustifolia. R.*

Dioicous. *Leaves* ternate; *leaflets* lanceolate, serrate, smooth. *Stipules* ovate, acute. *Cymes* shorter than the petioles. *Berries* spherical, one or two-seeded. I.

A delicate, scandent, perennial species, a native of Sumatra. Flowers in February; seeds ripen in November. 409

Stem scandent, slender, flat like a piece of tape. *Tendrils* simple. *Leaves* ternate. *Leaflets* petiolate, lanceolate, remotely serrate, acuminate, smooth on both sides, from three to six inches long, and from one to one and a half broad. *Petioles* shorter than the leaflets, channelled, smooth. *Stipules* triangularly ovate, acute, smooth. *Cymes* axillary, solitary, nearly round, small, and shorter than the petioles. *Flowers* small, greenish yellow, male on one plant and female on another.

MALE. *Calyx, corol* and *stamina* as in the genus. *Pistil* no other than a small abortive roundish body on the centre of a four-lobed gland.

FEMALE. *Calyx* and *corol* as in the male. *Germ* round, two-celled, with two seeds in each. *Style* none. *Stigma* large, obscurely four-lobed, and somewhat lacerated. *Berries* spherical, smooth, size of a pea, white, one or two-seeded, when cut or bruised very fetid. *Perisperm* conform to the seed. *Embryo* lodged in the lower half of the perisperm. *Cotyledons* nearly round. *Radicle* cylindric, inferior.

8. C. *carnosa. Linn. sp. pl. ed. Willd.* i. 658.

Stem flattened, perennial. *Leaves* petioled, ternate; *leaflets* oval, serrate. *Berries* four-seeded.

Tsjori-Valli. *Rheed. Mal.* vii. *p.* 17. *t.* 9.

Folium Causonis. *Rumph. Amb.* v. *p.* 450. *f. t.* 166. *f.* 2.

Teling. Kanapa-tiga.

Is common in hedges and forests. Flowering time the rainy season.

Stem perennial, flat like a piece of tape, climbing to an extent of many fathoms; *young shoots* villous. *Tendrils* leaf-opposed, from two to three-cleft. *Leaves* alternate, petioled, ternate. *Leaflets* oval, grossly serrate, downy, from two to three inches long. *Petioles* round, downy. *Stipules* oblong, caducous. *Cymes* as in the former species. *Flowers* small, white. *Berry* black, four-seeded. I. 410

9. C. *setosa. R.*

Herbaceous, scandent, bristly. *Leaves* sessile, ternate; *leaflets* grossly bristle-serrate. *Berries* one-seeded.

Teling. Barubutsali.

A native of forests and hedges in the Rajamundree Circar. Flowering time the rainy season.

Root fusiform, perennial. *Stems* herbaceous, succulent, round, striated, and covered with distinct, grandular, round-headed, white bristles, as is every part of the plant, even to the fruit. *Tendrils* leaf-opposed, generally two-cleft. *Leaves* alternate, sessile, ternate, rarely quinate. *Leaflets*, lateral two (or four, when there are five) are sessile, the middle one is short-petioled; all are oval, waved, fleshy, irregularly and grossly bristle-serrate, both sides armed with the fore-mentioned bristles, size various, from one to five inches long. *Stipules* cordate. *Cymes* as in the former species. *Petals* revolute.

Obs. Every part of the plant is exceeding acrid. I unfortunately tasted both the roots and berries.

The leaves toasted and oiled, are applied to indolent tumours to bring them to suppuration.

10. C. *feminea. R.*

Leaves digitate; *leaflets* petioled, broad-lanceolar, entire. *Style* none. *Stigma* from four to five-lobed.

A large scandent woody species, a native of woody mountains. Flowers during the wet and cold seasons.

Stem woody, climbing over trees. *Branches* flexuose from leaf to leaf. *Tendrils* simple,

Page Carey Ed. I. 411 opposite to the leaves. *Leaves* alternate, petioled, digitate. *Leaflets* oblong, and lanceolar, a little crenulate, pointed, smooth, shining, from four to six inches long, and one or two inches broad. *Petioles* round, smooth, from one to two inches long. *Cymes* short-peduncled, axillary. *Bractes* small, falling. *Flowers* small, green. *Calyx* small. *Corol* four or five-petalled, generally four. *Nectary* scarcely any. *Stamens* none, or at most a small seemingly sterile one. *Germ* superior, globose. *Style* none. *Stigma* four, or five-lobed, according to the petals in the corol. I have not seen the ripe fruit.

11. C. *elongata. R.*

Tender shoots succulent, polished. *Leaves* digitate; *leaflets* petiolate, oblong, acute, remotely serrate, smooth.

Beng. Dhemna, which is also the name of a long serpent.

Found amongst the mountains of the coast of Coromandel, as well as in the forests of Bengal. Flowering time the hot season.

Stem very long, running up and over the highest trees, a little compressed, and until many years old smooth, polished, succulent, deep green. *Branches* few or none, until the plant arrives at a great height, and is several years of age. *Leaves* alternate, petioled, digitate. *Leaflets* five, petioled, oblong, the lower pair obliquely so, serrate, smooth on both sides, from two to six inches long, and from one to three broad. *Petioles* round, smooth, from four to five inches long. *Petiolets* channelled. *Stipule* cordate, small, sub-adjoined. *Tendrils* leaf-opposed, simple. *Cymes* trichotomous, and dichotomous; the last divisions short, and ending in small umbellets. *Bractes* cordate, permanent. *Calyx* four-toothed. *Corol,* petals four, inserted in a belt which surrounds the body of the germ. *Nectary* a four-lobed, coloured elevation between the stamina and the insertion of the style. *Filaments* four, inserted opposite to, and just within the petals. *Anthers* incumbent. *Germ* oval. *Style* short. *Stigma* simple. *Berry* the size of a cherry, round-turbinate, smooth, when ripe black. *Seed* single, large, somewhat rugose.

I. 412 12. C. *auriculata. R.*

Scandent, perennial. *Leaves* quinate; *leaflets* oblong, acute, obtusely serrate, smooth above, villous underneath. *Stipules* ear-shaped. *Berries* round, smooth, one-seeded.

A native of Mysore, from thence sent to the Botanic garden in 1802, by Mr. B. Heyne, where it flowers and ripens its fruit through the whole year.

Stem, in five years old plants, as thick as a man's wrist, and of great length, even up to the tops of high trees. *Bark* spongy, and deeply cracked; *young shoots* succulent, round, and villous. *Leaves* alternate, remote, long-petioled, quinate. *Leaflets* petioled, oblong-obovate, or rhombic, acute, serrate, smooth and shining above, villous underneath; the *superior* from two to three inches long, two-thirds of that in breadth, the *exterior* much larger. *Petioles* nearly as long as the leaflets, round, and villous. *Stipules* ear-shaped, recurved. *Tendrils* leaf-opposed, two or three-cleft. *Cymes* axillary, or terminal; dichotomous or trichotomous, these again several times divided. *Germ* conical, containing four seeds in one cell, attached to its bottom. *Berry,* the size, shape, and appearance of a red cherry, one-seeded. *Seed* obliquely obovate, a little compressed, somewhat pointed at the base, and there attached to the bottom of the cell. *Integument* single, nuciform, rugose, covered with the green pulp of the berry, which adheres to it, and may, when dry, be considered a second integument. *Perisperm* conform to the seed, cartilaginous, gray; from the inner edge two fissures penetrate deeply, and divide it nearly into three portions. *Embryo* erect, white, lodged in the base of the perisperm. *Cotyledons* two; pedicelled, reniform. *Plumula* minute. *Radicle* oblong, inferior, a little curved, with the apex to the umbilicus.

13. C. *lanceolaria. R.*

Dioicous. *Leaves* pedate-quinate; *leaflets* lanceolar, smooth, remotely serrulate. *Stipules* conically lanceolate. *Cymes* the length of the petioles.

I. 413 Vallia-Tsjori-Valli. *Rheed. Mal.* vii. *p.* 15. *t.* 8.

A native of the mountains along the eastern frontier of Bengal. In the Botanic garden it blossoms in February and March.

Trunk scandent, stout, ligneous, in six years old plants as thick as a man's wrist, flattened, and grooved on the two flat sides. *Bark* dark brown, rough or deeply cracked. *Branches* and *branchlets* climbing, or pendulous when not supported; young parts round, green and generally smooth; extent of the whole plant several fathoms. *Tendrils* leaf-opposed, generally undivided. *Leaves* alternate, petioled, pedate. *Leaflets* generally five, lanceolar, recurvate, most remotely and sharply serrulate, long, taper, acute-pointed, both sides polished; texture rather fleshy, length from three to six inches, and from one to two broad. *Petioles* and *Petiolets* clothed with short, reddish hairs. *Stipules* large, of a narrow conic shape. *Cymes* sub-axillary, or close by the side of the base of the petioles, shorter than the petioles, or when most luxuriant much shorter than the leaves, the ultimate divisions each supporting a small globular umbellet, of small pale yellow flowers. *Bractes* round the base of the peduncles, cordate.

MALE. *Calyx* scarcely any. *Corol* and *stamina* as in the genus. *Pistil* none, an umbilicate, yellow, round, convex gland occupying its place.

14. C. *Pedata. Linn. sp. pl. ed. Willd.* i. 659.

Perennial, scandent. *Tendrils* simple, or two-cleft. *Leaves* pedate; *leaflets* broad-lanceolate, serrate. *Berries* four-seeded.

Belutta-Tsjori-Valli. *Rheed. Mal.* vii. *p.* 19. *t.* 10.

C. heptaphylla. *Retz. Obs.* v. 22.

Beng. Gwalia.

This is another very extensivley climbing species, as indeed they all are; a native of forests, hedges, &c. Flowering time the rainy season. Page Carey Ed

Stems woody, climbing over trees, &c. young parts covered with soft down. *Tendrils* leaf-opposed, simple or two-cleft. *Leaves* alternate, petioled, pedate. *Leaflets* oblong, irregularly serrate, downy, size various, the intermediate one is from four to six inches long, and the lowermost of the lateral ones from two to three inches long, the rest between these sizes. *Petioles* common, round, downy, from three to five inches long. *Stipules* cordate, pointed, falling. *Cymes* leaf-opposed, or axillary. *Peduncles* half the length of the petioles, jointed, and bracted a little above the middle. *Berries* white, four-lobed, depressed, four-seeded. I. 414

15. C. *serrulata. R.*

Perennial, scandent, smooth. *Leaves* pedate-quinate; *leaflets* oblong, serrate.

A native of Chittagong, where it blossoms in April and May.

SAMARA. Schreb. gen. N. 195.

Calyx four-parted. *Corol* four-petalled. *Stamina* inserted opposite to the centre of the insertions of the petals. *Drupe* superior, one-seeded.

1. S. *paniculata. R.*

Arboreous. *Leaves* opposite, entire, broad-lanceolate. *Panicles* axillary. *Stigma* two-lobed.

A tree, a native of the Circar mountains.

Leaves opposite, petioled, broad-lanceolate, tapering to a sharp narrow point, entire, smooth from three to five inches long, and one and a half or two broad. *Corymbs* axillary, small, peduncled, shorter than the leaves, divided by three-forked divisions. *Drupe* dry, oblong. *Nut* one-celled.

2. S. *polygama. R.*

Leaves opposite, short-petioled, broad-lanceolate, firm and polished. *Panicles* axillary and terminal. *Filaments* short, and inserted in a notch near the edge of the base of the petals.

A native of the Moluccas.

BLACKBURNIA. Schreb. gen. N. 199.

I. 415

Calyx four-toothed. *Corol* four-petalled. *Nectary* a staminiferous ring surrounding the base of the germ *Berry* superior, one-seeded. *Seed* arilled.

1. B. *monodelpha. R.*

Arboreous. *Leaves* alternate, lanceolate. *Filaments* united at the base.

A large erect timber tree, a native of the mountainous parts of the Circars. Flowering time the beginning of the hot season.

Trunk erect. *Bark* thin, firm, yellowish green on the outside; on the inside deep red, tinging the spittle with that colour. It is a strong astringent. *Branches* numerous, forming a large shady head. *Leaves* alternate, short-petioled, linear-oblong, smooth, below a little whitish, entire, waved, pointed; five or six inches long, and one and a half or two broad. *Stipules* none. *Racemes* axillary; small, erect, frequently compound. *Bractes* small, subulate. *Flowers* small, yellow. *Calyx* four-toothed. *Petals* four, oblong, expanding, apices revolute. *Nectary*, a ring surrounding the base of the germ, staminiferous. *Filaments* four, shorter than the petals, hairy; inserted into the margins of the nectary. *Anthers* oval. *Germ* superior, globular. *Style* short, stigma headed. *Berry* vertically compressed, succulent, the size of a large cherry, when ripe it has a deep purple bloom, which makes it very inviting to the eye. *Seed* one; arilled, seemingly two-lobed, of a lively purple throughout.

Obs. The wood of this tree is white, close-grained, and durable, the natives employ it for a variety of purposes.

FAGARA. Schreb. gen. N. 196.

I. 413

Calyx four-parted, or four-leaved. *Corol* four-petalled. *Germ* superior. *Capsule* superior, two-valved, one-seeded.

Embryo inverse, with but little perisperm.

1. F. *triphylla. Linn. sp. pl. ed. Willd.* i. 666.

Leaves opposite, ternate; *leaflets* oblong, entire. *Panicles* axillary, brachiate.

Ampacus angustifolia. *Rumph. Amb.* ii. *p.* 188. *t.* 62.

Found indigenous, by Mr. W. Roxburgh, on the Island of Pulo Pinang, and from thence sent to the Botanic garden, where in several years it has only reached the height of four feet, and for these last three years has blossomed regularly during the dry season.

Stem erect, ligneous, as thick as a walking cane, smooth, ash-coloured. *Branches* opposite; the tender parts round and slightly villous. *Leaves* opposite, long-petioled, ternate. *Leaflets* lanceolar or oblong, entire, smooth on both sides, length from two to ten inches, and from one to four broad. *Panicles* axillary, and in our single young individual, shorter than the petioles, brachiate, villous. *Flowers* numerous, minute, white, inodorous. *Bractes* [illegible] at the division of the pedicle. *Calyx* small, one-leaved, four-toothed. *Petals* four, oblong, white, smooth, spreading, length of the pistil, and four times longer than the calyx. *Filaments* four, length of the petals. *Anthers* oblong, incumbent. *Germ* superior, roundish, woolly, four-grooved for the filaments to rest in, four-celled, with two

Page Carey Ed. *ovula* in each cell, attached to the middle of the thickened axis. *Style* as long as the germ. *Stigma* large, four-lobed. *Capsule* from one to four, distinct, obovate, smooth, size of a field bean, one-celled, two-valved, opening along the upper and inner margin, and round the apex; a portion on the back does not separate spontaneously. *Seeds* generally two, roundish, size of a grain of black pepper, shining, blackish-chesnut colour as in the allied *Xanthoxylum*
I. alatum.

417 2. F. *Budrunga. R.*

Arboreous, armed with small incurved aculei. *Leaves* pinnate; *leaflets* five or six pair, unequally ovate, lanceolate, entire, acuminate. *Panicles* crowded.

Budrung the vernacular name in Silhet, where it grows to be a large tree. Blossoms in March and April, and the seeds ripen in July and August; they are used medicinally by the natives, being of a warm spicy nature with the fragrance of lemon peel.

Trunk straight, while young armed, but by age the aculei fall off. *Branches* and *branchlets* armed with innumerable, small, white, sharp, incurved prickles. *Leaves* crowded, from six to ten inches long. *Leaflets* five or six pair, opposite or nearly so, unequally ovate-lanceolate, entire, finely acuminate, smooth, from three to four inches long, by one and a half broad. *Panicles* terminal, much crowded, long-peduncled, trichotomous, the whole forming one large, very ramous globular panicle, which is shorter than the leaves. *Calyx* four-toothed. *Petals* four, elliptic, spreading. *Stamina* four, much longer than the petals. *Germ* ovate. *Style* short. *Capsule* the size of a pea, drupaceous, one-celled, two-valved; the exterior tunic is marked with cells filled with a fragrant balsam. *Seed* solitary, attached to the apex of the suture of the valves, round, smooth, polished, shining black. *Integuments* three; the exterior one thin and brittle, between it and the second is spread a quantity of dark orange-coloured pulpy matter, the second thick and hard, a perfect nut, and of a dull black colour, the third or innermost membranaceous. *Perisperm* in small quantity. *Embryo* inverse. *Cotyledons* obovate. *Radicle* ovate, pointing to the umbilicus.

3. F. *Rhetsa. R.*

Arboreous, round. *Leaflets* from eight to sixteen pair, lanceolate, falcate, smooth, entire. *Panicle* terminal.

I. *Teling.* Rhetsa-maun.

418 Rhetsa means a committee, or select number of men assembled to settle disputes, &c. and maun, means trees of the largest size. Under the shade of this tree the Hill people assemble to examine, agitate, and determine their matters of public concern, deliver discourses, &c.

It is a very large tree, a native of the mountainous parts of the coast. *Leaves* deciduous during the cold season; they come out again, with the flowers about the beginning of the hot season.

Trunk straight. *Bark* corky, deeply cracked, slight gray. *Branches* numerous, spreading to a great extent. *Prickles* very numerous, scattered over every part of the tree, small, very sharp, incurved; on the old wood they acquire a conical solid base. *Leaves* about the extremities of the branchlets, abruptly pinnate, from twelve to twenty inches long. *Leaflets* opposite, from eight to sixteen pairs, short-petioled, oblong or lanceolate, waved, attenuated to a narrow point, entire, smooth, about five or six inches long, and two broad, all nearly equal in size, with nerves which divide them unequally, the exterior division being twice as broad as the interior. *Petioles* round, smooth, a little channelled. *Stipules* none. *Panicles* terminal, and from the exterior arils, frequently cross-armed, particularly the extreme ramifications. *Peduncles* and *pedicels* smooth, sometimes compressed. *Bractes* minute, falling. *Flowers* very minute, yellow. *Calyx* four-leaved. *Filaments* shorter than the petals. *Style* thick, length of the filaments. *Stigma* tapering. *Capsule* round, size of a pea, dry, one-celled, two-valved; seed one, round, glossy black.

Obs. The unripe capsules are like small berries, they are gratefully aromatic, and taste like the skin of a fresh orange. The ripe seeds taste exactly like black pepper, but weaker; from this circumstance I conceive this may be F. *Piperita*, yet I have always found the leaflets entire. The bark, I mean the inner lamina, is also acrid, with a mixture of
I. bitter.

419 4. F. *nitida. Roxb.*

Shrubby. *Branchlets*, *petioles* and *ribs* armed. *Leaflets* two or three pairs, with a terminal odd one, oblong, lucid, remotely gland-crenate, apex rather long and emarginate. *Racemes* axillary.

Tcheum-tsew of the Chinese.

Introduced from Canton into the Botanic garden by Mr. W. Kerr in 1812, and in January of the following year one of the plants blossomed abundantly.

The flowers as in the other species, but the pistillum is three or four-lobed, each appearing to end in a recurved style with a two-lobed stigma. The shrub, therefore, approaches nearer than any of the preceding species to Zanthoxylon.

LUDWIGIA. Schreb. gen. N. 204.

Calyx four-parted. *Corol* four-petalled. *Capsule* inferior, four-sided, four-celled. *Seeds* numerous.

1. L. *parviflora. R.*

Annual, branches diffuse. *Leaves* alternate, lanceolate, short-petioled, smooth. *Flowers* axillary, sessile. *Capsule* linear, obsoletely four-sided.

A small, ramous plant, a native of Bengal; flowering time the rainy season; seed ripe about October. Page Carey Ed.

Root ramous, annual. *Stem* short, round, in young plants erect. *Branches* many, diffuse, slightly striated; the whole plant of a dark-ferruginous colour. *Leaves* alternate, short-petioled, lanceolate, entire, smooth, length from one to three inches. *Flowers* axillary, small, sessile. The leaves about the ends of the branches are so small and crowded, as to make the extremities of the branchlets appear like leafy spikes. *Bractes*, a most minute one on each side of the insertion of each flower. *Calyx*, the divisions taper to most acute points, and equal the oblong petals. *Capsule* beneath, linear, obsoletely four-sided, smooth, four-valved. *Seeds* coloured, numerous, very small. I. 420

2. L. *prostrata. R.*

Lower branches creeping. *Leaves* alternate, petioled, lanceolar. *Flowers* axillary, sessile. *Capsule* filiform, with one row of seeds in each cell, attached immediately to the axis.

A native of Pegu, from thence introduced into this garden, where it blossoms and ripens its seed during the rainy season.

Root annual. *Stem* leaning much to one side, from one to two feet long. *Branches* numerous, the lower ones longer than the stem, spreading flat on the ground and striking root, smooth, striated, generally coloured with red. *Leaves* alternate, short-petioled, lanceolar, entire, smooth, size various, the largest from three to five inches long. *Flowers* axillary, sessile, from one to several on the same axill, very small, much elevated on the four-sided peduncle-like germ. *Petals* lanceolar, longer than the calyx, yellow. *Filaments* four, length of the style. *Anthers* roundish, two-lobed, always after expansion found adhering to the large clammy stigma. *Capsules* slender, sub-filiform, more or less curved, smooth, four-cornered; *angles* rounded, sides grooved; four-celled. *Seeds* oval, minute, pink-coloured, disposed in one vertical row and attached immediately to the axis, without the intervention of any thing like a receptacle.

Obs. This species is so much like my L. *parviflora* as not to be distinguished, except by attending to the germ, or capsule. In that plant it is shorter, thicker, always straight, and with numerous crowded seeds in each cell, attached to a projecting receptacle, as in L. *alternifolia, Gært. Carp.* i. 158. *t.* 31. In this there is only one vertical row in each cell attached to the axis.

OLDENLANDIA. Schreb. gen. N. 205. I. 421

Calyx four-parted, permanent. *Corol* one-petalled, four-parted. *Capsule* inferior, two-celled, many-seeded. *Receptacle* free, fastened to the partition by the base only.

Obs. Would it not be better to omit this Gærtnerian part of the generic character, and unite our Indian species of *Hedyotis* to Oldenlandia? For except the attachment of their respective receptacles I can find no other mark by which the two genera are to be distinguished, and surely this is too minute and inconspicuous for the travelling Botanist to be able at all times to discover.

1. O. *umbellata. Linn. sp. pl. ed. Willd.* i. 676. *Roxb. Corom. pl.* i. *N.* 3.

Erect. *Leaves* opposed, tern, and quatern, linear, scabrous. *Umbels* terminal. Inside of the corol hairy.

Teling. Cheri-Velloo.

Tam. Saya-wer, or Imburel.

Much cultivated on the light sandy lands near the shores of Coromandel; where the root is employed to dye the best, and most durable red on cotton cloth.

2. O. *alata. König's Mss.*

Erect, four-sided. *Leaves* opposite, sub-sessile, elliptic, smooth. *Panicles* terminal. *Corol* campanulate; *mouth* shut with hairs. *Capsules* turbinate.

Beng. Gundha-baduli.

Hedyotis *racemosa. Linn. sp. pl. ed. Willd.* i. 565.

Annual, a native of the borders of rice lands and moist places; appears and flowers during the rainy season.

Stem several, erect, with few branches, four-sided, smooth, about a foot or eighteen inches high. *Leaves* opposite, sub-sessile, oblong, smooth, entire, succulent, about two inches long. *Stipules*, connecting membrane broad, toothed. *Umbels* terminal, few-flowered. *Flowers* white, small. *Pedicels* four-sided. *Capsules* turbinate, smooth; receptacle clubbed, free, affixed by the small end into the partition near its base. I. 122

3. O. *paniculata. Burm. Fl. Ind.* 38. *t.* 15. *f.* 1.

Biennial, creeping. *Leaves* ovate-lanceolate. *Peduncles* three-flowered, or three times that number.

Introduced into the Botanic garden from the Moluccas, in 1798, where it blossoms the greatest part of the year.

Stems none; but numerous, diffuse, four-sided, smooth, ramous branches, spread close on the ground in every direction, and strike root from their joints, their general length about [illegible] inches. *Leaves* opposite, small, ovate-lanceolate, smooth, and of a firm thick texture, the largest about an inch long. *Connecting* membrane with subulate divisions. *Peduncles* axillary, and terminal, longer than the leaves, smooth, four-sided, with generally three, small, white flowers, on pedicels of unequal length. *Corol; tube* gibbous, mouth shut with fine white hairs. *Stamens*, in the belly of the tube below the hairs which shut its mouth. *Stamina* entire.

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4. O. *crystallina. R.*

Annual, very ramous. *Pedicels* solitary, shorter than the leaves, generally two-flowered. *Leaves* sessile, lanceolate, oblong, underneath marked with crystalline dots.

Beng. Punki.

Hedyotis *pumila. Linn. sp. pl. ed. Willd.* i. 566.

A small, very ramous, diffuse, annual plant, a native of Bengal; appearing in the rainy season.

Stem none. *Branches* numerous, diffuse, about six inches long, somewhat four-sided. *Leaves* opposite, approximate, sessile, oblong, and lanceolate-oblong, smooth and marked with beautiful crystalline specks underneath, length about half or three quarters of an inch. *Pe-*
I. *duncles*, from within the stipulary sheaths, about half the length of the leaves, generally bear-
423 ing two, minute white flowers on their proper pedicels. *Corol*, mouth of the tube hairy. *Capsules* much compressed laterally.

Obs. It is readily distinguished from O. *biflora* by the general habit of the plant, this being short, diffuse, very ramous, with oblong or lanceolate-oblong leaves, while the other is slender with long straggling branches, and linear-lanceolate leaves. I place less confidence in in the crystalline appearance of the underside of the leaves, as soil, &c. may remove it.

5. *diffusa. R.*

Annual, round, flaccid. *Leaves* sessile, linear-lanceolate, acute. *Peduncles* axillary, solitary, one-flowered; *capsules* sub-globular, smooth.

Hedyotis *diffusa. Linn. sp. pl. ed. Willd.* i. 566.

Found, growing in boxes, which were sent with Nutmeg plants to the Botanic garden at Calcutta from Banda.

Root ramous, annual. *Stems* short, flaccid, spreading, round, most slightly scabrous, from six to twelve inches long. *Leaves* opposite, sessile, linear-lanceolate, acute, smooth on both sides. *Connecting* membrane, from entire to many-cleft. *Peduncles* axillary, solitary, four times shorter than the leaves, one-flowered. *Flowers* pretty large, pure white, smooth. *Stigma* deeply two-cleft. *Capsule* roundish, smooth.

Obs. The Linnæan definition of O. *capensis* would lead one to imagine this to be that plant; but the observation *simillima* O. *repenti, at capsula glabra,* in the *Plant. p.* 127, convinces me it cannot be so; as this plant has not the smallest resemblance to *Oldenlendia repens,* now *Dentella.*

6. O. *biflora. Linn. sp. pl. ed. Willd.* i. 676.

Peduncles solitary, two-flowered, shorter than the narrow lanceolar sessile leaves.

Sans. Kshetra-purputee.

Beng. Khet-papura.

I. Antirrhinum humile, &c. *Burm. Zeyl.* 22. *t.* 11. good.

424 Annual; native of most parts of India. A small weak straggling delicate plant, appearing in the rainy season.

7. O. *herbacea. R.*

Erect, four-sided, dichotomous. *Leaves* linear-lanceolate. *Peduncles* in pairs from alternate axills, one-flowered.

Hedyotis *herbacea. Linn. sp. pl. ed. Willd.* i. 566.

Teling. Veri nella-vemoo.

A native of road sides under thin bushes, &c. Flowering time the rainy season.

Stem erect, four-sided, smooth, short, ramous. *Branches* always two-cleft; from six to twenty four inches high. *Leaves* opposite, *sessile,* linear-lanceolate, spreading, smooth. *Stipules,* connecting membrane finely-toothed. *Peduncles* axillary, always two from the small axills, with a branchlet, or the rudiments of one between them, round, nearly as long as the leaves, one-flowered. *Capsule* smooth.

8. O. *ramosa. R.*

Diffuse, ramous. *Leaves* narrow-lanceolate. *Peduncles* axillary, with from one to several flowers.

A native of Pegu, from thence introduced into this garden by Mr. F. Carey, where it blossoms and ripens its seed during the rains, and the early part of the cool season.

Root annual. The *stems* and numerous branches diffuse, somewhat four-sided, pretty smooth, spreading to the extent of one or two feet. *Leaves* opposite, narrow-lanceolate, smooth, entire, whiter underneath; length about an inch. *Connecting* membrane many-toothed. *Peduncles* axillary, from one to many-flowered. *Flowers* small, white. *Calyx,* the divisions conical. *Coral* with gibbous tube, mouth bearded. *Filaments* short. *Anthers* within the tube, blue. *Germ,* &c. as in the genus.

I.
425

AMMANNIA. Schreb. gen. N. 206.

Corol four-petalled, or none; when present inserted in the plaited mouth of the calyx which is from four to eight toothed. *Capsule* superior, from one to four-celled. *Seeds* numerous.

1. A. *rotundifolia. Buch.*

Diffuse. *Leaves* opposite, round, entire. *Flowers* spiked, petals oval. *Capsule* four-lobed.

Plants sent from Lukshmee-poora and Malda, where they are indigenous, flowered in the Botanic garden during the cold season of 1797.

Stems several, creeping, with ascending apices, round, smooth, and succulent; whole plant spreading from six to eight inches. *Leaves* opposite, sub-sessile, orbicular, entire, smooth, and succulent. *Spikes* terminal and axillary, the terminal often compound. *Bractes* opposite; *exterior* cordate; *interior* lanceolate, and often very small, one-flowered. *Flowers* numerous, small, pink-coloured. *Calyx* four-parted, divisions obtuse. *Corol* of four, large, oval, sessile, pink-coloured withering petals. *Capsule* hid in the bottom of the remaining calyx, and corol, four-lobed. *Seeds* numerous. Page Carey Ed.

2. A. *octandra. Linn. sp. pl. ed. Willd.* 679. *Roxb. Corom. pl.* 2. *N.* 133.

Annual, erect, brachiate, four-sided. *Leaves* sessile, narrow-sagittate; *peduncles* from two to three-flowered; *flowers* octandrous. *Capsule* four-celled.

Ammannia *octandra. Suppl. Plant. p.* 127.

Annual, a native of moist places; appearing in the rainy and cold seasons.

Root fibrous. *Stem* straight, four-sided, smooth; from one to three feet high. *Branches* numerous, cross-armed, and like the stem. *Leaves* opposite, sessile, linearly-sagittate, smooth, margins a little revolute, from one to two inches long, and about a quarter of an inch broad. *Peduncles* axillary, very short, from two to three-flowered. *Flowers* small, colour a beautiful bright red. *Bractes* minute. *Calyx* and *corol* as in the genus. *Filaments* as long as the corol. *Anthers* incumbent. I. 426

3. A. *multiflora.*

Erect, four-sided, ramous branches simple. *Leaves* sub-sagittate, stem-clasping. *Peduncles* from three to seven-flowered. *Petals* large. *Capsule* one-celled.

A native of open lands about Calcutta, annual, from six to twelve inches in height, appearing in the wet and cold seasons.

Stem straight, four-sided; angles sharp; sides convex. *Branches* cross-armed. *Leaves* opposite, decussate, horizontal, sessile, linear with enlarged cordate, stem-clasping base, size very various. *Peduncles* axillary, almost always solitary, about as long as the smaller leaves, generally three-flowered, though in the luxuriant plants there are often two or three, with one between, the lateral flowers have pretty large long pedicels. *Calyx* as in the family. *Petals* large, roundish, red. *Capsule* one-valved, receptacle globular, affixed at the base only.

4. A. *vesicatoria. R.*

Erect, ramous, branches undivided. *Leaves* opposite, sessile, lanceolar. *Flowers* axillary. *Corol* none. *Capsule* one-celled.

Beng. Daud-maree.

Teling. Aghundra-pakoo.

An annual species; found in wet cultivated ground during the rainy and cold seasons.

Stem erect, from six to thirty-six inches high, obsoletely four-sided, very branchy. *Branches*, below opposite, decussated; above frequently alternate. *Leaves* opposite, sessile, lanced, smooth; *floral leaves* many times smaller than those below. *Corol* one. *Pericarp* one-celled, one-valved, half covered with the calyx. I. 427

Obs. It differs from A. *baccifera* in having a capsule of one cell, in being evalvular, and in the leaves being lanced, in that species they are linear-cordate at the base, and embrace the stalk.

This plant has a strong muriatic, but not disagreeable smell. Its leaves are exceedingly acrid; they are used universally by the natives to raise blisters in rheumatic pains, fevers, &c. The fresh leaves bruised and applied to the part intended to be blistered perform their office in the course of half an hour or a little more, and most effectually.

5. A. *pentandra. R.*

In the lower part of the plant creeping and simple, erect portion ramous; four-sided. *Branches* simple. *Leaves* sessile, lanceolate. *Flowers* axillary, solitary, sessile, pentandrous. *Capsule* one-celled.

A native of moist places; flowering in the rainy and cold seasons.

Stems creeping near the base, above erect; the erect part is branchy, four-sided, smooth, and coloured; from six to eight inches high. *Leaves* opposite, sessile, lanceolate, smooth, entire. *Flowers* axillary, solitary, sessile. *Bractes* two, lanceolate, pressing the calyx laterally. *Calyx* four-cleaved, alternately smaller and inflected. *Corol*, petals five, very minute. *Stamens* five.

6. A. *nana. R.*

Base creeping, erect portion ramous. *Branches* compound. *Leaves* wedge-shaped, sessile. *Flowers* solitary. *Capsule* one-celled.

A native of such places as the last described, it is considerably smaller than that species, but more branchy.

Stems as in A. *pentandra. Leaves* opposite, sessile, wedge-formed, smooth, entire. *Flowers* axillary, solitary, sessile.

TRAPA. Schreb. gen. N. 208. I. 428

Calyx four-parted, or four-leaved. *Corol* four-petalled. *Germ* inferior, two-celled; cells from one to two-seeded; *attachment* of the ovulum superior. *Nut* turbinate, armed with two or four horns, (which were the leaflets of the calyx.) *Embryo* simple, lodged in the apex of the ample perisperm.

1. T. *bicornis.*

Nuts with two, opposite, recurved, very obtuse horns.

Chin. Lin ko.

Page Carey Ed.

A native of China, where it is carefully cultivated in lakes, ponds and other receptacles of water.

2. T. *bispinosa. R.*

Nut with two opposite, straight, barbed, spinous horns.

Nectary cup-shaped, curled.

Shringata. Asiat. Res. vol. iii. *p.* 253.

Sans. Sringata, *Julukuntuka.*

Beng. Panee-phul. Singhara.

Panover-tsjerana, *Rheed. Hort. Mal. vol.* xi. *p.* 64. *t.* 33. (evidently intended for this plant, and not T. *natans.*) Found floating on sweet, standing water in Bengal and many other parts of India. Flowering time the rainy season.

Root consisting of numerous, simple, capillary fibres which issue from the under margins of the cicatrices of the fallen leaves. *Stems* stoloniferous, often several feet long, floating. *Leaves* petioled, alternate, approximate round the apex of the shoots, of a rhomboidal-reniform shape; with the posterior margins entire, and the anterior ones serrate dentate, smooth above, a deep green, villous and purple underneath; from three to four inches broad, and nearly as long. *Petioles* villous, lengthening with the age of the leaves, towards the apex much
I. smaller; this part contains many inflated vescicles, which render the whole plant very buoyant.
429 *Stipules* two pair, the superior one simple, semi-lanceolate and caducous, the inferior pair at first simple and filiform; but becoming ramous by age, permanent.

Pedúncles axillary, solitary, shorter than the petioles, one-flowered, incurved until the blossoms begin to decay, after which they bend down under the surface of the water, where the fruit grows, and comes to maturity. *Flowers* pure white, expanding above the surface of the water late in the afternoon. *Calyx* four-leaved, in opposite pairs, leaflets lanceolate, villous, one of the pairs permanent. *Corol* contracted. *Petals* four, contracted into a tube at the base by the firmness of the calyx, above much broader, and expanding; *margins* much curled. *Nectary* cup-shaped, on the top of the germ, round the swelled base of the style, eight-grooved, with the margins minutely lacerate, and curled. *Filaments* four, incurved. *Anthers* oval, incumbent. *Germ* inferior, obconical, two-celled, with one ovulum in each attached to the top of the partition. *Nut* inferior, of a turbinate triangular shape, a hard ligneous texture, and a blackish brown colour, armed with two, strong, straight, conic, barbed spines, from the upper angles; elegantly embossed, one-celled, not opening, but having a perforation in the top for the *embryo* to pass, which is guarded with a circle of stiff converging bristles from its margin, forming a conical roof over the aperture. *Seed* single, conform to the nut. *Integument* single, of a slightly brown colour, thin, but rather tough, and adhering firmly to the perisperm. *Perisperm* conform to the seed, white and of a firm cartilaginous texture. *Embryo* in the apex of the perisperm.

Obs. This is evidently a species perfectly distinct from *natans*, and *bicornis.* From the former it differs in having only two horns, and from the latter in the horns being straight, very sharp, and barbed.

The nuts are sold in the markets when in season, their kernels being much esteemed
I. by the Hindoos.
430 3. T. *quadrispinosa. R.*

Nut with two opposite pairs of straight, acute, spinous horns.

A native of Silhet, where it is found floating on lakes, and pools of fresh water; its kernels are also esculent.

POTHOS. Schreb. gen. N. 210.

Spathe sub-cylindric. *Spadix* covered with florets. *Calyx* none, or four-petalled. *Corol* none. *Stamina* indefinite. *Germ* one-celled, from one to three-seeded; *attachment* of the ovula inferior (in *heterophylla* superior.) *Berry* one-celled, rarely many-seeded. *Embryo* uncinate, without perisperm.

1. P. *scandens. Linn. sp. pl. ed. Willd.* i. 684.

Parasitic, rooting. *Petioles* as broad as the lanceolar leaves. *Flowers* axillary. *Spadix* gobular, reflex.

Ana-Parua. *Rheed. Hort. Mal.* vii. *p.* 75. *t.* 40.

Adpendix duplo folio. *Rumph. Amb.* v. 490. *t.* 184. *f.* 2.

A native of Chittagong, Malabar, and of Amboyna, and other eastern Islands. Flowering time in the former country, the month of April.

Stems as thick as a slender ratan, often ramous, rooting upon trees in the most shady forests, round, smooth, and less succulent than any other species which I have yet met with, except P. *gracilis. Leaves* alternate, petioled, lanceolate, entire, smooth; length from two to four inches, breadth about an inch. *Petioles* most amply winged, so as to be nearly as broad as the leaves themselves, almost as long, equally entire, smooth, and marked with similar veins. *Peduncles* axillary, solitary, clothed with many small, ovate, bractiform scales up to the spathe, where they are completely recurved. *Spathe* boat-shaped, erect. *Spadix* globular, reflex. *Calyx*, or *corol*, some roundish scales mixed amongst the germs, and of
I. nearly the same length, the exact number to each germ not ascertained. *Stamina*, about
431 four obovate scales to each germ, with two polleniferous pits on the inside under the retuse apex. *Germs* many, oblong, one-celled, with one, two, or three *ovula* attached to the bottom of the cell, and immersed in a clear gelatinous liquid. *Style* none. *Stigma*, an umblicated elevation on the apex of each germ. *Berries* oblong, size of a French bean,

red, pulpy, one-seeded. *Seed* solitary, or two, conform to the berry. Page Carey Ed.

2. P. *officinalis. R.*

Perennial; parasitic. *Stems* rooting. *Leaves* oblong, cordate, entire. *Flowers* terminal; *florets* naked, octandrous. *Berries* one-seeded.

Sans. Guja-pippulee, Kuri-pippulee, Kupi-vullee, Kolu-vullee, Shreyusee, Vushira.

Beng. Guj-pippul.

A native of Bengal, and common in some parts of the Midnapore district, where it is cultivated for its fruit, which, cut into transverse pieces and dried, is an article of some importance in the Hindoo *materia medica*, called Guj-pippul, and sold by the druggists under that name. Flowering time the rainy season; seed ripe in January.

Stem perennial, creeping up to the top of large trees, and like the *Ivy*, taking firm hold with its innumerable roots; about as thick as the little finger, smooth, except the cicatrices of the fallen leaves, and the roots from the side next the tree which supports it. *Leaves* alternate, sub-bifarious, petioled, oblong-cordate, entire, filiform, pointed, smooth on both sides; from six to ten inches long, and from three to six broad. *Petioles* sheathing, channelled, smooth, shorter than the leaves. *Peduncles* terminal, solitary, round, smooth, scarcely half the length of the petioles; when in flower erect, but often drooping, from the increasing weight of the fruit. *Spathe* sub-cylindric, opening a little on one side; when in flower, smooth on both sides; greenish without, and of a pale yellow colour within, apex filiform, I. and a little twisted; length about six inches. *Spadix* sub-cylindric, obtuse, equalling the 432 spathe; colour a pale greenish yellow, dotted with the dark-coloured stigmas of the numerous fructification which every where covered it. *Perianth* none. *Corol* none. *Filaments;* I conclude there are about eight to each germ, two on each face; but the want of both perianth and corol, renders it difficult to assign the exact number of stamens to each floret, they are very short, and seem inserted on the base of the germ. *Anthers* sub-sagittate, four-lobed. *Germ* numerous, parallelopiped, truncate, vertically attached to, and completely covering every part of the common cylindric receptacle, one-celled, with one seed attached in an oblique manner to the bottom of the cell. The substance of the germ is replete with rigid, sharp, vertical bristles, which are readily detached, and stick in the skin, causing pain and itching. The virtue of the drug may reside in these, as it does in the short stiff hairs of the legumes of *Carpopogon pruriens. Style* none. *Stigma*, a channel filled with gelatinous matter, running from the cell of the germ to the centre of the truncate apex, where it ends in a small slit, embraced by two darker-coloured, somewhat callous lips. *Pericarps (capsulæ circumscissæ)*, as numerous as the germs, and of the same form, only larger; a few only are fertile, of a soft fleshy texture, one-celled, one-valved; when the fruit is ripe they detach themselves from the receptacle, and drop off, leaving the seed behind still attached to it. *Seed* single, ovate-cordate, somewhat two-lobed, covered at the base with a thin, red, succulent aril. *Integuments* two, exclusive of the aril; *exterior* pale yellow, polished, thin, hard, and elastic; *inner* membranaceous. *Perisperm* none. *Embryo* uncinate, white, very succulent. *Radicle* inferior, thickened, and in other respects exactly as in Gærtner's figures of *Potamageton natans, vol.* ii. *p.* 23. *t.* 84.

Obs. The plant described by Sir William Jones by the name of Guj-peepul, (See *Asiatic Researches, vol.* iv. *p.* 303.) is my *Tetranthera apetala.* He however observes, that it was I. from a native gardener he obtained the Sanscrit name of his plant, but as he mentions that 433 Valli means a creeper, he suspects in some degree, the accuracy of his information.

Chavica, or Chavya mentioned under the same head is a new species of Piper.

3. P. *Peepla. R.*

Perennial, sub-parasitic, rooting on trees. *Leaves* long-petioled, oblong, acuminate. *Flowers* sub-terminal; *florets* apetalous, tetrandrous.

Peeplee of the Hindoos of the Silhet district, where the plant grows. Flowering time, April and May.

Stem rooting on trees, like the common *Ivy* of Europe, scarcely so thick as the little finger, round and smooth, somewhat contracted between the leaves. *Leaves* petioled, alternate, oblong, entire, smooth on both sides, dagger-pointed; length from four to twelve inches. *Petioles* as long as the leaves, channelled, smooth. *Peduncles* sub-terminal, round, smooth, the base inserted in sheaths from three to four inches long. *Spathe* sub-cylindric, opening on one side, smooth, acute; length of the spadix. *Spadix* cylindric, obtuse, length of the inside of the spathe; colour pale yellow, every part completely covered with the fructification, without any proper perianth, or corolla. *Filaments* about four to each germ, and about half its length. *Anthers* linear. *Germs* numerous, of a square, wedge shape, truncate, the whole of their substance replete with small pellucid, sharp bristles, which readily enter the skin, and produce pain and itching. *Style* none. *Stigma* sub-rotund.

4. P. *gracilis. R.*

Scandent. *Leaves* lanceolate, entire, on short, round petioles above their sheaths. *Spadix* peduncled, cylindric, scarcely equalling its linguiform spathe.

A native of Amboyna; it has a great resemblance to *Rumphius's Adpendix arborum, Hort. Amb. vol.* v. *t.* 181. *f.* 2. I. 434

5. P. *gigantea. R.*

Perennial. *Stems* rooting. *Leaves* oblong, entire. *Flowers* axillary; *florets* naked, heptandrous.

This is the stoutest of these parasitic *Aroideæ* that I have met with. It is a native of Prince of Wales' Island; from thence introduced into the Botanic garden by Mr. W. Roxburgh. Flowering time in Bengal the close of the rains in October. It has not yet produced

Page Carey Ed. ripe seed there.

Stems perennial, creeping on the ground, or upon trees and plants; in a very thriving state, of six years' growth, not more than three and four feet long, and about four inches in circumference, round, and strongly marked with the circular scars of the fallen leaves. *Leaves* alternate, sub-bifarious, petioled, approximate, oblong, cordate, entire, smooth; length from one to two feet high, and about two-thirds thereof in breadth. *Petioles* as long as the leaves, channelled, smooth, much enlarged at the base, and stem-clasping. *Peduncles* axillary, solitary, very short. *Style* sub-cylindric, short-pointed, opening a little on one side about the time that the anthers discharge their pollen, smooth on both sides, of a dirty dull purple colour, length about six inches. *Spadix* cylindric, length of the spathe, obtuse, every part most closely covered with the sessile fructifications; colour a pale lively yellow, beautifully dotted with the dark linear stigmas. *Filaments* about seven to each germ, short, broad, and thin. *Anthers* two-lobed. *Germs* very numerous, parallelopiped, truncate, much flattened, vertically one-celled, with generally two ovula, obliquely attached to the bottom of the cell. *Style* none. *Stigma* a vertical, linear, grooved, dark-coloured projection on the middle of the truncate germ, as in the last species; the substance of the germ and spathe also abound in short stiff bristles, which readily enter the skin, causing pain and itching. *Calyx* and *corol* none.

I. 435 6. P. *pertusa. R.*

Scandent, sub-parasitic, rooting on trees. *Leaves* cordate, perforated on one side, and pinnatifid on the other. *Corollets* apetalous, tetrandrous. *Anthers* two-lobed.

Elettadi-Maravara. *Rheed. Hort. Mal.* xii. *p.* 41. *t.* 20 and 21.

A very large perennial, sub-parasitical species, so much like *Dracontium* pertusum, that they may be readily taken for the same plant. It is a native of the mountainous parts of the coast of Coromandel, running up, and over the highest trees, to which it adheres like *Ivy* by roots issuing from the joints.

Leaves alternate, petioled, cordate, smooth, generally perforated with linear oblong holes on one side, and on the other passing through the margins as in the pinnatifid leaves; their length from twelve to eighteen inches long. *Petioles* nearly as long as the leaves, deeply channelled, wanting the stipule-like processes at the apex, which Miller's figure represents, in which particular this plant differs from that in the first instance. *Scape* short. *Spathe* gibbous, pointed, little longer than the spadix, cylindric, obtuse, every where covered with the fructifications. *Corol* none. *Filaments* intermixed amongst the germs, (the number to each germ cannot be determined, but I think about four,) compressed; apex bifid. *Anthers* oval, two to each filament. *Pistils* mixed with the membranaceous filaments, four-sided, lobed. *Style* none. *Stigma*, a knob on the centre of the lobed germ.

7. P. *pinnata. Linn. sp pl. ed. Willd.* i. 686.

Sub-parasitic, rooting on trees, the apices of the shoots clothed with fibres. *Leaves* pinnatifid. *Flowers* terminal.

Adpendix laciniata. *Rumph. Hort. Amb.* v. 489. *t.* 183. *f.* 2.

Found in forests in the Malay countries, rooting up and running over trees of great size. It is readily distinguished from my *decursiva*, by the abundance of brown fibres which are
I. found on the young shoots, and the lower part of the petioles.

436 8. P. *caudata. R.*

Perennial, rooting. Extreme shoots leafless, flagelliform, and pendulous. *Leaves* ovate-cordate, from entire to pinnatifid; *segments* sub-ensiform, one-nerved.

From Prince of Wales' Island slips were brought to the Botanic garden at Calcutta, in 1797; and now, 1812, it is one of the most common and most extensive climbers; but has not as yet blossomed in the garden. The long flagelliform pendulous extremities of its shoots readily distinguish it from every other species I have seen; the leaves also are oftener undivided than otherwise.

9. P. *decursiva. R.*

Perennial, rooting on trees, smooth. *Leaves* sub-decursively pinnate; *segments* falcate, cuspidate. *Flowers* lateral, or axillary, long-peduncled.

Guj-pippul is the vernacular name of this very large, powerful species, in the Silhet district, where it is indigenous, and blossoms during the hot season.

Stems as thick as a stout cane, rooting on, and ascending trees like the common *Ivy*; round, smooth, and rather contracted between the leaves. *Leaves* approximate, alternate, petioled, pinnatifid, or completely pinnate; from two to six, or seven feet long, including the petioles; *segments*, or leaflets, linear-falcate, cuspidate, entire, smooth, sometimes from three to four-nerved or triple-nerved; length from six to eighteen inches, and two broad. *Petioles* from six inches, to three feet long, round, smooth, stem-clasping, and the lower portion more deeply channelled. *Peduncle* solitary, axillary or lateral, about six inches long, substantially thick, round, smooth, and replete with the same white bristly spicula that are found in the germ and seed vessels. *Spathe* sub-cylindric, length of the peduncle. *Spadix* cylindric, length of the spathe, completely covered with the innumerable fructifications. *Calyx* none. *Corol*
I. none, nor any thing like either. *Filaments* about four to each germ, and nearly of their
437 length. *Anthers* cordate, appearing beyond the germ. *Germs* numerous, the most general form a four-sided wedge, apex truncate. *Style*, scarcely any. *Stigma*, an elevated vertically oblong opening.

10. *pinnatifida. R.*

Perennial, rooting on trees. *Leaves* pinnatifid; *segments* falcate, one-nerved.

A native of Sumatra; from thence brought into the Botanic garden at Calcutta, where it grows freely on the trunks of trees, to which its lateral roots adhere most firmly, the cri-

ginal one being still in the ground, where first planted. Although some of the plants are six or seven years old and about twenty feet high, they have not yet blossomed. Page Carey Ed.

11. P. *heterophylla. R.*

Caulescent, creeping, armed. *Leaves* from cordate-sagittate to pinnatifid. *Spathe* erect, spiral, many times longer than the short cylindric spadix. *Florets* tetrapetalous, tetrandrous.

Can it be *Dracontium spinosum, Flor. Zeyl.* 328 ?

A native of Bengal, delighting in a rich, moist soil ; it flowers, though rarely, during the cool season.

Root fibrous. *Stems* and *branches* creeping, armed with short, sharp prickles. *Leaves* until the plants are old, and begin to flower, simple-sagittate, and cordate-sagittate, afterwards pinnatifid, with long lanceolar, acuminate segments, smooth above, nerve and larger veins armed on the under side ; from six to fourteen or sixteen inches long. *Petioles* completely armed ; *base* sheathing ; above round, generally shorter than the leaves. *Scapes* axillary, solitary, one-flowered, length of the petioles, and armed like them. *Spathe* sub-cylindric, acute, spirally twisted above the spadix ; colour a dark dull reddish purple ; length from eight to twelve inches long, and as thick as the little finger, opening at the base only where the spadix is lodged while the pollen is discharging, after which it shuts, as before that period. *Spadix* cylindric, obtuse, completely covered with hermaphrodite florets ; length little more than one inch. *Calyx* none. *Petals* four, obovate, concave. *Filaments* four, broad, length of the petals. *Anthers* two-lobed. *Germ* oblong, one-celled, containing one *ovula* attached to the top of the cell. *Style* none. *Stigma* glandular, flat. I 438

12. P. *Lasia. R.*

Armed. *Leaves* radical, pinnatifid. *Spathe* very long, and twisted above the spadix. *Berries* one-seeded, muricate.

Lasia aculeata. Lourier. Cochin Ch. ed. Willd. i. 103.

Teling. Moola-sari.

Beng. Kanta-kutchoo.

A native of boggy, or wet places among the Circar mountains.

Leaves radical, petioled, pinnatifid ; *segments* lanceolate, smooth, shining, the nerves on the under side armed with prickles ; length, about two feet, breadth about a foot and half. *Petioles* erect, from two to four feet long, round, every where thickly armed with sharp prickles. *Scape* the length of the petioles, round, and equally covered with prickles. *Spathe* very long, erect, below gaping ; above the spadix twisted, leathery, dull red colour. *Spadix* about one-sixth of the length of the spathe, cylindric, every where covered with the fructifications. *Corol, stamens,* and *pistil* as in the genus. *Berries* (or rather capsules,) wedge-formed, somewhat four-sided, murexed, one-seeded. *Seed* two-lobed.

CHLORANTHUS. Schreb. gen. N. 1730.

Calyx none. *Corol,* a three-lobed, unilateral antheriferous *petal* on the outside of the pistillum. *Germ* semi-superum one-seeded ; attachment of the ovulum superior. *Drupe* one-seeded.

C. *inconspicuus. Linn. spec. Plant. ed. Willd.* i. 688. I. 439

Tcheu-lan, of the Chinese.

From Canton it has been received into the Botanic garden at Calcutta, where it grows freely to be a small upright shrub, with many straight sub-simple smooth branches, of about two feet in height, with oblong opposite serrulate smooth leaves. Flowering time in Bengal the rainy season. It has not yet ripened its seeds there.

ELÆAGNUS. Schreb. gen. N. 213.

Corol none. *Calyx* gibbous, border four-parted. *Germ* one-celled, one-seeded ; attachment of the ovulum inferior. *Drupe* inferior, one-seeded. *Embryo* erect, without perisperm.

1. E. *triflora. R.*

Shrubby, scandent, armed. *Leaves* oblong, obtuse, scaly. *Flowers* axillary, three-fold, peduncled.

Elæagnus foliis oblongis acuminatis maculatis. *Burm. Zeyl. p.* 92. *t.* 39. *f.* 1.

A native of Sumatra, from thence introduced into the Botanic garden in 1804, where it blossoms in December. Seeds ripen three or four months afterwards.

Stems and *branches* of considerable size, and great extent, climbing. *Bark* of the ligneous parts a beautiful dark purplish colour, and smooth. The short lateral branchlets which issue from the young climbing shoots are more or less recurvate and answer the end of tendrils ; when old, they become stout thorns. *Bark* of the tender part most beautifully clothed with numerous ferruginous, stellate scales. *Leaves* alternate, short-petioled, oblong, entire, obtuse, above smooth ; underneath ornamental with numerous stellate, ferruginous and silver-coloured scales ; from two to three inches long, and from one to two broad. *Stipules* none. *Flowers* axillary, three-fold, small, white. *Peduncles* longer than the corols, one-flowered. *Calyx* with a short, four-sided tube ; and border of four cordate segments, on the outside a little scaly ; on the inside smooth. *Filaments* none. *Anthers* four, sessile in the mouth of the tube of the calyx. *Germ* superior, oblong, embraced by the contracted bottom of the calyx, one-celled, one-seeded. *Style* as long as the calyx. *Stigma* oblong, glandular, oblique. *Berry* oblong, succulent, when ripe pale orange colour, pulp soft, of rather a pleasant astringent taste, and not acid like E. *conferta ;* one-seeded. *Seed* sub-clavate. *Integuments* two, *exterior* eight-ribbed, soft, and lined with much wool ; *inner* membranaceous. *Perisperm* none. I. 440

Page Carey Ed. *Embryo* erect. *Cotyledons* conform to the seed, amygdaline. *Plumula* two-lobed. *Radicle* oval, inferior.

2. E. *conferta. R.*

Shrubby, scandent. *Leaves* alternate, oblong-pointed, covered with silver-coloured scales underneath. *Flowers* axillary, crowded, short-peduncled.

Beng. Guara.

This is a very large and ramous, scandent shrub ; a native of the mountains near Silhet, in Bengal. Flowering time, the cold season. Seed ripe in March.

Young shoots covered with innumerable rust-coloured scales. *Leaves* alternate, short-petioled, generally erect, oblong-pointed, entire, with innumerable small silver coloured scales, particularly underneath, which gives them a bright colour ; from three to four inches long, and from one and a half to two broad. *Petioles* short, scaly. *Peduncles* axillary, crowded, short. *Flowers* small, straw-coloured. *Calyx ; tube* somewhat gibbous, four-sided ; outside scaly ; border of four cordate segments ; its mouth marked on the inside with four curved lines, on their pointed junctures the filaments sit. *Style* hairy. *Drupes* oblong, succulent, when ripe red.

Obs. The calyx of my plant cannot be said to be placed on the germ ; it has, as it were a lower tube which envelopes the germ only, this part grows with the fruit, and finally becomes the pulpy part thereof as in the *Nyctagineae* of Jussieu.

I. 441 3. E. *arborea. R*

Arboreous. *Branchlets* often spinous, pointed. *Leaves* oblong and broad-lanceolate, entire, silvery underneath. *Flowers* in axillary fascicles. *Fruit* cylindrically oblong.

A large tree, native of the Garrow Hills, and there called *Sheu-Shong.* Flowering time December. The fruit shaped like an olive, but much larger; it is eaten by the natives when ripe, which it is generally in March and April.

CANSJERA. Juss. gen. ed. Ust. 85.

Calyx large, gibbous, four-toothed. *Corol* none. *Nectary* four-petalled, embracing the germ, and of the same length. *Berry* superior, one-seeded.

1. C. *scandens. Roxb. Corom.* ii. *N.* 103.

Shrubby, scandent. *Leaves* alternate. *Spikes* axillary.

Scheru-valli caniram. *Rheed. Mal.* vii. *p.* 7. *t.* 4.

Tsjeru caniram. *ibid. p.* 3. *t.* 2. appears to be the same plant.

A large woody climbing shrub ; a native of the Circar mountains.

Leaves alternate, two-faced, short-petioled, broad-lanceolate, smooth, entire, about three inches long, and one broad. *Spikes* axillary, generally single, short, every where covered with flowers. *Bractes* solitary, small, oval, one-flowered. *Flowers* small, sessile, yellow. *Calyx* inferior, one-leaved, gibbous; *mouth* four-toothed. *Corol* none, except the calyx, or nectary be accounted one. *Nectary* four-leaved ; *leaflets* cordate, acute, half the length of the calyx, inserted round the base of the germ and embracing it. *Filaments* four, inserted into the base of the calyx, and rather shorter than it. *Anthers*, ovula within the calyx. *Berry* oblong, smooth, red, juicy, size of a pea, one-celled. *Seed* single, shaped like the berry.

I. 442

SANTALUM. Schreb. gen. N. 215.

Calyx semi-supera, campanulate, four-cleft. *Corol* none. *Nectarial scales* four, alternate with the stamina. *Germ* one-celled, one-seeded, attachment inferior. *Berry* one-seeded. *Embryo* inverse, and furnished with a perisperm.

1. S. *album. Linn. sp. pl. ed. Willd.* i. 691.

Leaves oblong.

Sandalum album. *Rumph. Amb.* ii. 42. *t.* 11.

Chandana. *Asiatic Researches, vol.* iv. *p.* 253.

Santalum verum. *Linn. Mat. Med.* 102.

Sans. Gundhasaru, Muluyuju, Bhudrushree, Chunduna.

Beng. Chundun.

Pers. Sundul-sufed.

Sandal-wood. *Buchanan's Journey*, i. 186, and 202. ii. 117, 132, and 536. iii. 192.

A native of the mountainous parts of the coast of Malabar. That of Timor, and the neighbouring Islands is most probably the same species. In the Botanic garden near Calcutta, the trees reared from seeds brought from the former country, thrive luxuriantly, and produce flowers and ripe seed nearly the whole year round.

Trunk in trees of twelve years' growth in the Botanic garden, only a few feet high, when they divide into branches; and there from two and a half to three feet in circumference. *Bark* brownish, and scabrous, with longitudinal fissures. *Branches* numerous, dividing much, spreading, and rising in every direction, forming nearly a spherical head. *Young shoots* round and smooth ; extreme height of our largest twelve or thirteen years old trees, about twenty-five feet. *Leaves* opposite, petioled, oblong, generally obtuse, smooth, entire, glaucous underneath; *length* from one and a half to three inches. *Petioles* scarcely one-fourth the length of the leaves, smooth.

I. 443 *Stipules* none. *Thyrsi* axillary and terminal, much shorter than the leaves. *Pedicels* opposite, the lower pair of each thyrsus generally three-flowered. *Flowers* numerous, small, when they first expand straw-coloured, changing to a deep ferruginous purple, inodorous, as are all the exterior parts of the growing plant, even when bruised. *Calyx* one-leaved, campanulate ; border

four-parted; *segments* ovate, smooth, base of the bell only permanent. *Corol* none, except the calyx, or nectarial glands are so called. *Nectary* of four, roundish, sessile, thick, fleshy glands, on the mouth of the bell of the calyx, alternate with the segments of its border, and when the flower first expands, the most coloured part, entire. In *Sirium* (now *Santalum*) *myrtifolium*, they are *lobate*. *Filaments* four, alternate with the nectarial scales, and of the same length, smooth, but behind each there rises a tuft of white hairs from the disk of the segments of the calyx, perfectly distinct from the stamina, but of the same length, the ends of these long, white, woolly hairs adhere to the back of the small, two-lobed anthers. *Germ* semisuperum, one-celled, containing one conical seed, attached to the bottom of the cell. *Style*, length of the tube of the calyx. *Stigma* three-nerved, four-lobed. *Berry* pyrenous, round, smooth, when ripe black, and succulent, size of a cherry, and crowned with the remaining calyx, one-celled. *Nut* solitary, spherical; three small, equi-distant elevations from the apex run a little way down the sides. *Seed* conform to the nut. *Integument* single, soft, white, spongy, lining the nut, and adhering to it and the seed also. *Perisperm* conform to the seed, white, amygdaline. *Embryo* inverse, subulate, nearly as long as the vertical diameter of the perisperm. *Cotyledons* two, unequal, linear-lanceolate. *Plumula* minute, semilunate. *Radicle* tapering, superior. Page Carey Ed.

Obs. The descriptions and original figures of the following species, *Sirium myrtifolium. Corom. Plants, vol.* i. *t.* 2. were taken from the plants which grow wild, on the mountains north of the Rajamundri Circar, on the coast of Coromandel, where the trees are but of a small size, scarcely more than a large shrub, or bush, with lanceolate leaves; and the wood of little value. It is now nearly twenty years since that description, and the drawings were made, and I have reason to think the tree which produces the sandal wood of Malabar,* and Timor, to be different, and having had an opportunity of cultivating the former, viz. that of the Malabar mountains in the Botanic garden for these thirteen years past, I do not hesitate to say, that the Circar tree is at least a strongly marked variety of the Malabar sort. For that reason I have thought it advisable to give the foregoing full description, of the true *sandal wood*, which I hope will tend to clear up the botanical history of this celebrated tree, and its associate *Sirium myrtifolium*. They evidently belong to one genus, to which I have thought it necessary to assign a new essential character, and whether I consider them to be distinct species of that genus, or varieties of one species, must be of very little consequence. For my own part I think it nearer the truth to consider them distinct species. I therefore call the narrow-leaved one *Santalum myrtifolium*. I. 444

The nature and history of the wood, white and yellow *Saunders* or *Sandal*, are now too well known to require any thing in addition from me.

2. S. *myrtifolium. R.*

Leaves opposite, lanceolate.

Sirium *myrtifolium. Roxb. Corom. pl.* i. *N.* 2. *Willd.*

A native of the Circar mountains, where it is but of a small size, and the wood of little or no value.

Leaves opposite, short-petioled, spreading, lanceolate, entire, waved, smooth, shining; about two inches long, and three-fourths of an inch broad. *Stipules* none. *Racemes* thyrsiform, terminal, compound, small, erect. *Flowers* small, reddish. *Calyx* superior. *Tube* short, a little gibbous. *Border* four-cleft; *divisions* ovate, expanding, coloured. *Corol* no other than the above, except the nectary be such. *Nectary* four-leaved, obcordate, notched, inserted into the mouth of the calyx. *Filaments* four, short, hairy, inserted into the calyx, alternate with the leaflets of the nectary. *Germ* globular. *Style* length of the tube. *Stigma* four-lobed. *Berry* globular, size of a large pea, smooth, juicy, black, when ripe one-seeded. I. 445

Obs. Birds greedily eat the berries, by which means it is propagated extensively. I do not know that the wood of this small tree is ever used as a perfume.

GYROCARPUS. Jacq. Gært.

Calyx superior, four-leaved, unequal. *Corol* none. *Nectary* of four clavate glands, alternate with the stamina. *Berry* dry, one-seeded, ending in two long wings. *Embryo* erect, spirally rolled up; no perisperm.

1. G. *Jacquini. Roxb. Corom. pl.* i. *N.* 1.

Polygamous. *Panicles* dichotomous.

Gyrocarpus *asiaticus. Linn. sp. pl. ed. Willd.* iv. *p.* 982.

Teling. Tanukoo.

Grows to be a very large tree, is chiefly a native of the mountainous parts of the coast of Coromandel. *Leaves* deciduous about the end of the wet season. Flowers during the cold season when the trees are naked; the leaves come out soon after.

Trunk generally erect. *Bark* smooth, greenish, ash-coloured. *Branches* thin, irregularly spreading in every direction. *Leaves* approximated, about the extremities of the branchlets petioled, broad-cordate, three-nerved, often slightly lobed, above smooth, below downy, with two pits on the upper side of the base; length and breadth various, but in general about five or six inches each way. *Petioles* round, downy, three inches long. *Panicles* terminal, umbel-like; divisions two-forked. *Flowers* very small, yellow. I. 446

HERMAPHRODITE FLOWERS solitary, sessile in the divisions of the panicle. *Calyx* superior, four-leaved; *leaflets* unequal; *exterior* pair small, oval, bractiform, caducous; *interior*

* I include Java or the other Islands thereabout, because the leaves of our tree agree particularly well with Rumphius's figures above quoted.

Page Carey Ed. pair large, wedge-shaped, three-toothed, permanent, increasing in size with the pericarp into two long, membranaceous wings. *Corol* none. *Nectary* consisting of four clavate, yellow glands. *Filaments* four, longer than the calyx, inserted alternately with the nectarial glands into a perforated receptacle. *Anthers* quadrangular, opening on each side with an oval lid. *Germ* inferior, ovate. *Style* none. *Stigma* small, immersed in the perforation of the receptacle of the filament and nectarial glands. *Capsule* globular, wrinkled, one-celled, one-valved, not opening spontaneously, size of a cherry, ending in two long, obtuse, lanceolate, membranaceous wings. *Seed* one.

Obs. The wood of this tree which is white and very light, is employed to make *Catamarans* (floats), when to be had, in preference to any other.

TETRANDRIA DIGYNIA.

CUSCUTA. Schreb. gen. N. 227.

Calyx four or five-leaved or parted. *Corol* one-petalled. *Germ* two-celled, one or two-seeded, attachment inferior. *Capsules* superior, two-celled, circumcised. *Embryo* spiral, rolled round the perisperm, with an inferior radicle.

1. C. *reflexa. Roxb. Corom. pl.* ii. *N.* 104.

Parasitical; *flowers* racemed, pentandrous. *Scales* of the nectary bearded. *Capsules* four-seeded.

Beng. Huldi-alg*usi*-lu*ta*.

I. *Teling.* Sitama-poorgonooloo.

447 This plant is parasitical, appearing on any bush in the cold season. *Stems* or *branches* filiform, succulent, twining, very ramous, leafless, smooth, yellow. *Racemes* numerous. *Flowers* white, short-pedicelled. *Calyx* five-leaved; *leaflets* cordate, permanent. *Corol; tube* cylindric; *mouth* five-parted; *division* reflexed. *Nectary* of five scales, which surround the germ, and are inserted into the bottom of the tube. *Filaments* five, very short. *Anthers* oval, appearing half above the mouth of the tube. *Style* scarcely any. *Stigma* two, large, fleshy, expanding, pointed.

2. C. *aggregata. R.*

Head round, sessile, composed of ten or twelve perfectly sessile, aggregate, pentandrous flowers.

Accidentally introduced into the Botanic garden amongst flax seed from Bagdad. When the *flax* plants were a few inches high, this little delicate, leafless, filiform, round, yellow parasite began to make its appearance, adhering in such quantities to their stems and leaves, as to destroy whole beds in a very short space of time.

3. C. *sulcata. R.*

Peduncles in fascicles, each bearing a few pentandrous, sessile flowers, with a fleshy furrowed calyx. *Capsule* two-seeded, surrounded by the deeply grooved calyx.

A native of Bengal, appears adhering to *Amaranthus oleraceus*, and some other plants, during the cool season. Is a plant of small size, of a pale yellow colour, throughout perfectly smooth.

Peduncles generally collected in small, remote fascicles of two, three, four, or more, each supporting from two to four, small, sessile, white flowers. *Bractes* ovate. *Calyx* five-toothed, permanent, becoming fleshy, and deeply ribbed, with from six to ten ribs, length of the tube of the corol. *Corol; tube* short. *Border* five-cleft; *divisions* oval, obtuse, reflexed.

I. *Nectarial scales* five, below the insertion of the filaments, divided nearly to the base, into
448 many, fine, filiform segments. *Filaments* five, inserted a little below the fissures of the corol. *Germ* round. *Styles* two. *Stigma* headed. *Capsules* two-celled. *Seeds* solitary.

4. C. *capitata. R.*

Heads round, sessile, bracted, with from ten to twenty pentandrous flowers. *Calyx* and *corol* papillose, pellucid and white.

Hind. and *Beng.* Alg*usi*.

A most beautiful, small parasite, found in great abundance growing on the lower part of the stems of *Crotolaria Juncea*, during the months of February and March.

Stems numerous, filiform, smooth, except at the parts where it grows to the stalks of its supporter, there tuberculate; extent from one to two feet high; colour pale yellow. *Leaves* none. *Flowers* from ten to twenty, forming most beautiful, round, sessile, white, pellucid heads. *Bractes* a single one under each head, which is white, membranaceous, and oblong. *Calyx* and *corol* five-cleft, swelled with pellucid cells, like the *Ice-plant*. *Nectarial* scales reniform, ciliate. *Stamens* five. *Germ* two-celled, with two seeds in each, attached to the bottom of the cells. *Styles* two. *Stigma* simple.

COLDENIA. Schreb. gen. N. 233.

Calyx four-leaved. *Corol* infundibuliform. *Germ* superior, four-celled, one-seeded, attachment superior. *Nuts* four. *Embryo* inverse, and furnished with a perisperm.

1. C. *procumbens. Linn. sp. pl. ed. Willd.* i. 712.

A small annual, spreading flat on the ground, and in general very common on dry rice-fields during the cold season; but never to be seen from the beginning of the periodical rains till they are completely over.

TETRANDRIA TETRAGYNIA.

BRUCEA. Schreb. gen. N. 1508.

Calyx four-parted. *Petals* four. *Germs* four, one-seeded, attachment inferior. *Berries* four, superior, one-seeded. *Embryo* inverse, with scarcely any perisperm. Sometimes a fifth part is added.

1. B. *sumatrana. R.*

Shrubby. *Leaflets* serrate. *Racemes* axillary, generally compound.

Lussa-Radja. *Rumph. Amb.* Auctuar. 27. *t.* 15.

Mal. Ampadoo-Barrowing.

A native of Sumatra. From thence Mr. Ewer sent the seeds to the Botanic garden, where in one year the plants were about four feet high with a straight ligneous stem; and few branches. They then began to flower in May, and continued to blossom and ripen their seed all the year.

Leaves scattered, unequally-pinnate, from twelve to eighteen inches long. *Leaflets* from four to six pair, opposite, short-petioled, obliquely ovate-lanceolate, grossly and obtusely serrate, pointed, villous underneath, from three to six inches long, very bitter, and somewhat fœtid. *Petioles* common, round, and villous. *Stipules* none. *Racemes* axillary, solitary, from one to six, or eight inches long, somewhat compound, dark purple, and clothed with a few white hairs. *Flowers* numerous, very minute, dark purple, and in all the Sumatra plants completely hermaphrodite. *Bractes* subulate, hairy, very small, and caducous. *Calyx* four-leaved, or deeply four-parted. *Segments* small, ovate-lanceolate, deep purple, hairy on the outside and with the corols becoming reflexed. *Petals* four, longer than the calyx, lanceolate, dark purple, and hairy on the outside. *Nectary* a dark purple, four-lobed, fleshy cup surrounding the insertion of the germs. *Filaments* four, short, purple, inserted under the margin of the nectary. *Anthers* oval, large, and deep purple till they discharge their pollen. *Germs* four, superior, one-celled, with one ovulum in each attached to the upper and inner side of the cell. *Styles* single, short, recurved, one to each germ. *Stigmas* simple. *Drupes* four, when all come to maturity, size of a small grain of black pepper, smooth, dark purple, one-celled. *Nut* conform to the drupe, rugose, one-celled, inner edge thinner, and the upper half of it marked with a white line, (the umbilicus). *Seed* conform to the nut. *Integuments* single, adhering to the perisperm, thin and white. *Perisperm* in very small quantity, indeed it may be called a fleshy inner integument. *Embryo* as long as the perisperm, straight, inverse. *Cotyledons* oval, fleshy. *Plumula* two-lobed. *Radicle* roundish, superior. I. 450

Obs. Since I first described this tree, and only from plants that were completely hermaphrodite I have found some plants perfectly male, and others as completely female. In this plant, therefore, we have another instance of Trioicous Polygamy.

From the sensible qualities of the green parts of this plant, being somewhat fœtid, and simply, though intensely bitter, it promises to be as good an antedysenterical medicine as *Bruce's Abyssinian Wooginos* itself. As soon as the plants arrive at greater maturity the bark shall be tried, and compared with Angustura bark which has by some been thought that of *Brucea antedysenterica* of *Bruce's Travels*, &c. *vol.* v. *p.* 69. also of *I. F. Miller, Tab.* 25. and still better described and figured by *L. Heritier* under the name *Brucea ferruginea, Stirp. Nov.* 19. *t.* 10. See also *Linn. sp. pl. ed. Willd.* iv. 742.

MYRIOPHYLLUM. Shreb. gen. N. 1440.

Calyx four-parted. *Corol* four-petalled. *Style* none. *Stigmas* four. *Seeds* four, naked. *Embryo* inverse. I. 451

1. M. *tetrandrum. R.*

Leaves verticelled, all filiform-pinnatifid. *Flowers* axillary, verticelled, tetrandrous. *Calyx* four-leaved.

Compare with Hottonia sessiliflora. *Linn. sp. pl. ed. Willd.* i. 813.

Teling. Neerla-pamarum.

It grows in sweet water; appearing during the rains.

Stems round, articulate, spongy below the water, length various, above the water from four to six inches, about the thickness of a crow's quill. *Leaves* verticelled, pinnatifid, below the water they are much larger, with capillary segments; above the water they are small. *Flowers* very small, white, verticelled, *i. e.* one in the axill of each leaf. *Calyx* above, four-leaved; *leaflets* permanent. *Petals* four, oblong. *Filaments* shorter than the petals.

2. M. *tuberculatum. R.*

Leaves verticelled, pinnatifid. *Flowers* axillary, verticelled, tetrandrous; fruit tetraceous, tubercled.

A native of borders of lakes, and other moist places near Calcutta, in blossom most part of the year, and very much like M. *tetrandrum.*

Stems creeping, round, jointed, length various, the erect extremities about five or six inches. *Leaves* verticelled, pinnatifid, or acutely serrate. *Flowers* verticelled, sessile, one in the axill of each leaf, small pink-coloured. *Calyx* none. *Corol*: *petals* oblong, expanding, pink coloured. *Filament* short. *Anthers* linear. *Seeds* united in the form of a four-lobed, tubercled pericarp.

Page Carey Ed.

POTAMOGETON. Schreb. gen. N. 234.

Calyx none. *Corol* four-petalled. *Germs* four. *Styles* none. *Seeds* four. *Embryo*
I. hooked, without perisperm.
452 1. P. *indicum. R.*

Creeping. *Leaves* alternate, from narrow-lanceolate to elliptically oval, opaque, glossy, many-nerved. *Anthers* four pair, attached to the claws of the round concave petals.

A native of the borders of fresh water lakes and ditches in the vicinity of Calcutta. *Flowers* in February and March.

Stems creeping. The small simple roots which issue from the joints are all I can discover, for while the plant advances from the apex, it decays at the opposite end, so that I do not think any part of them exists for one year. *Branches* few, and like what I call the stems; they are all round, smooth, and jointed at various distances. *Leaves* alternate, except next to the flowers, and there often opposite, petioled, from narrow-lanceolate to elliptically oval, opaque, even, and very smooth, or rather glossy, entire, obtuse, obscurely many-nerved; size very various. Those that remain immersed are narrower, longer, more strongly marked with nerves, and sub-transparent. *Petioles* simple, not sheathing, length various, in plants left by the water much shorter than the leaves. *Stipules* solitary, axillary, sheathing, length of the petioles, slit halfway or more on the inside. *Peduncles* solitary, axillary, or opposite to a leaf, round, rather thicker, smooth, and nearly as long as the cylindric spike, which each supports. *Flowers* small, numerous, green. *Calyx* none. *Petals* long-clawed, nearly round, incurved, fleshy; concave within, convex on the back, permanent. *Filaments* none. *Anthers*, four pairs attached to the claws of the petals on the inside. *Germs* four, ovate-oblong, one-celled, with one ovulum in each. *Styles* short, and thick. *Stigmas* a dark speck on the apex of the styles. *Drupes* obovate, smooth. *Nut* conform to the drupe, one-celled. *Embryo* curved, as represented by *Gærtner* in P. *natans, vol.* ii. *t.* 84.

I. 2. P. *tuberosum. R.*
453 *Leaves* alternate, and only opposite at the floriferous forks, sessile, linear, much waved, entire, clear, when dry membranaceous.

Found immersed in extensive masses, in ponds, lakes, and receptacles of fresh water in Bengal, during the dry season, chiefly when in flower in February, it rises so near to the surface as to allow the little spikes of flowers to emerge completely.

Root of long simple fibres, brown, &c. according to the colour of the mud they enter; on the creeping joints are generally found small roundish-lobate, viviparous tubers. *Stems* and branches of various lengths, according to the depth of the water, &c. a groove on each side gives them the appearance of being compressed, thick as a pack-thread, smooth, at the bottom of the water creeping, towards the extremities when in flower dichotomous; previously to that period the branches are alternate and axillary. *Leaves* sessile, alternate, except at the floriferous fork of the branches, where they are opposite, linear, rather obtuse, much waved, finely and acutely serrulate, with two slender nerves near the margin, pellucid, from two to three inches long, by little more than a quarter of an inch broad. *Stipules* sheathing, short, smooth, greenish like the other parts of the plant, and scarcely to be distinguished from them. *Spikes* solitary in the fork of the branches, rather long-peduncled, from four to eight-flowered, when in blossom emerged, afterwards immerged. *Corol, stamina*, and *germ* as in the genus, but here there certainly is a style with four large, obliquely truncated stigmas. *Seed* as in P. *natans, Gært. sem.* ii. 23. *tab.* 84.

I.
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CLASS V.

PENTANDRIA MONOGYNIA.

HELIOTROPIUM. Schreb. gen. N. 239.

Corol salver-shaped; throat contracted with vaults. *Seeds* four, naked, or each covered with its proper bark.

1. H. *indicum. Willd. sp.* i. 470.

Annual, diffuse, ramous. *Leaves* petioled, cordate. *Spikes* leaf-opposed, peduncled, solitary. *Fruit* two-cleft.

Bena patsja. *Rheed. Mal.* x. *p.* 95. *t.* 48.

Sans. Shrcehustinee, Bhooroondee.

Beng. Hatti-soora.

This is one of the most common plants in India, it is in flower at all seasons, and delights in out-of-the-way corners, rubbish, &c. where the soil is rich and dry.

Stems and *branches* diffuse, dichotomous, hairy, general height one, or two feet, but spreading to an extent greater than its height. *Leaves* for the most part alternate, petioled, cordate, wrinkled, margins curled. *Spikes* leaf-opposed, generally solitary, peduncled, longer than the leaves. *Flowers* rigidly sessile, minute, in two rows on the upper side of the spikes. *Corol* longer than the calyx. *Tube* gibbous; *border* five-lobed, pale rose colour. *Seeds* united towards the base, two-cleft, smooth.

2. H. *coromandelianum. Willd. sp.* i. 742. Page Carey Ed. I. 455

Annual, ascending, pubescent. *Leaves* petioled, obovate, entire. *Spikes* paired, and solitary.

Beng. Naga-phoolee.

A native of Coromandel, Bengal, &c. Flowering time the hot and rainy seasons.

Root simple, annual. *Stems* several, near the base spreading on the ground, afterwards ascending; clothed with white, soft hair. *Leaves* scattered, petioled, obovate, entire, hairy like the stems and branches. *Spikes* terminal, and interspersed among the leaves, generally paired. *Flowers* numerous, small, white, placed in a waved row on the upper side of the spikes. *Calyx* half the length of the corol, the exterior, inferior, divisions longer.

3. H. *paniculatum. R.*

Erect, ramous, hairy. *Leaves* petioled, ovate-oblong. *Spikes* terminal, panicled, secund. *Tube* of the corol long and gibbous.

A native of Chittagong, flowers during the hot season.

LITHOSPERMUM. Schreb. gen. N. 241.

Corol funnel-shaped, throat perforated, and naked. *Calyx* five-parted. *Germ* four-celled, with one pendulous ovulum in each.

1. L. *viridiflorum. R.*

Shrubby, erect. *Leaves* ovate-lanceolate, rugose, entire. *Spikes* peduncled, twice or thrice dichotomous, recurved.

A native of Chittagong, where it blossoms during the rains, and cool season.

Stems erect, ligneous, soon throwing out many, patent alternate, round, hairy branches; whole height from three to five feet. *Leaves* alternate, petioled, ovate-lanceolate, acute, rugose, entire, a little hairy underneath; length from four to six inches, and from two to three broad. *Peduncles* at first terminal, but becoming lateral; as vegetation advances, twice, thrice, or even oftener bifid; each division ending in a somewhat long, recurved, secund spike, with two rows of small, exquisitely beautiful, green flowers on its convex side. *Bractes* none. *Calyx* five-leaved. *Corol* with the *tube* enlarged towards the base, twice the length of the calyx; *border* slightly five-notched; *throat* open. *Anthers* linear, sub-sessile, near the base of the tube of the corol. *Germ* ovate, four-celled, with one ovulum in each, attached to the top of the axis. *Seeds* ovate-cordate, smooth. I. 456

CYNOGLOSSUM. Schreb. gen. N. 243.

Corol funnel-shaped; the throat contracted with vaults. *Seeds* four, depressed, affixed to the style.

1. C. *racemosum. R.*

Annual, erect, ramous. *Leaves* lanceolate, sessile, hairy. *Spikes* paired and solitary, lateral, and twining. *Flowers* pedicelled. *Seeds* echinate, distinct.

Found growing on rubbish in the vicinity of Calcutta; flowering time the rainy season.

Root annual. *Stem* erect, with many alternate, erect branches from every part; all covered with short, stiff, depressed hairs; the whole height about a foot and half. *Leaves* alternate, sessile, lanceolate, hairy, veined, a little wrinkled, margins minutely curled, and ciliate; from two to three inches long. *Spikes* terminal, and axillary, peduncled, generally paired, though sometimes single; when at their full length much longer than the leaves, with the apices incurved. *Flowers* alternate, on the upper side of the spikes pedicelled, while expanded erect, afterwards ternuous, very small, white, with a purple throat which is somewhat contracted by five two-lobed glands. *Calyx* longer than the corol; *leaflets* oval, hairy. *Stamens* just within the mouth of the tube of the corol. *Seeds* distinct, of a roundish conical shape, armed with many short, thick, stiff, glutinous, headed bristles, and affixed to a conical receptacle, which has four corresponding concavities to receive the four seeds. I. 457

2. C. *diffusum. R.*

Annual, diffuse, hairy. *Leaves* oblong, soft, hairy. *Flowers* solitary. *Stamens* hid in the gibbous tube. *Seeds* scabrous.

A native of Bengal; appearing in gardens, and on cultivated land in the cold season.

Stems diffuse, slender, clothed with stiff hairs; length from six to eighteen inches. *Leaves* alternate, the inferior ones petioled; the superior ones sub-sessile, all entire, oblong, soft, and hairy. *Flowers* solitary, between the leaves, short-peduncled, small, white, with a tinge in the throat. *Calyx* longer than the tube, hairy. *Corol* with the *tube* gibbous, its mouth contracted with five broad, emarginate scales. *Stamens* hid in the belly of the tube. *Seeds*, or arils obovate, scabrous, affixed by the base, and on the inside to the stigma.

3. C. *marifolium. R.*

Annual, diffuse. *Leaves* bifarious, oblong, hairy. *Flowers* solitary between the leaves; *corol* half the length of the calyx; *seeds* round, rough.

A native of the eastern parts of Bengal; flowering time the cold season; soon after which the seed ripens, and the plants perish.

Root annual. *Stem* none, but several, ramous, slender, round, hairy branches spread on the ground. *Leaves* alternate, bifarious, sub-sessile, elliptic, hairy underneath: half an inch in length, and about half that in breadth. *Flowers* axillary, or between the leaves, short-peduncled, solitary, very small, of a pale whitish blue. *Calyx* five-leaved; *leaflets* lanceolate, hairy on the outside, nearly twice as large as the corol. *Corol*, the *tube* very short, the *limb*

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I. 458 contracted, by five emarginate scales alternate with the stamens. *Filaments* short; *anthers* large, half hid in the mouth of the tube of the corol. *Style* short, clavate. *Stigma* emarginate. *Seeds* rough, round, almost hid in the calyx, affixed to a very short columnar receptacle.

BORAGO. Schreb. gen. N. 248.

Corol rotate. *Throat* closed with rays.

1. B. *indica. R. Willd. sp.* i. 776.

Annual, diffuse. *Leaves* sub-sagittate, stem-clasping, the lower ones opposite. *Flowers* solitary, drooping. *Calyx* conical, with five hornlets behind.

Beng. Chhota-kulpa.

Common over most parts of India, producing flowers and ripe seed the greatest part of the year.

Root fibrous, annual. *Stem* scarcely any, but many dichotomous, hairy, spreading branches of about a foot in length. The lower *leaves* opposite; the upper ones alternate, all sessile, stem-clasping, sub-sagittate, entire, hairy. *Peduncles* opposite to, or between the leaves, drooping, hairy, one-flowered. *Flowers* pale blue. *Calyx* five-parted, with the fissures extended into five recurved hornlets; divisions adhering by their margins, giving to the whole a conical shape. *Corol* a little longer than the calyx; divisions cordate with filiform apices. *Anthers* united into a firm, taper cone over the mouth of the tube of the corol.

2. B. *zeylanica. Willd. sp.* i. 777.

Annual, erect, ramous, strigose. *Cauline* leaves opposite, sub-sessile, lanceolate; *floral* ones alternate with the solitary, one-flowered, drooping peduncles.

A native of various parts of India. Flowering time the cold season.

I. 459 *Root* annual. *Stem* erect, *branches* opposite, round, jointed, hispid with numerous sharp, stiff bristles of two sizes; the larger inserted on coloured glandular elevations; the height of the whole plant in a good soil from four to six, or even eight feet. *Leaves* opposite, sub-sessile, lanceolate, entire, harsh, with a few stiff, scattered hairs. *Floral* leaves terminal, alternate, small, sessile, cordate-lanceolate. *Peduncles* sub-solitary, one-flowered, drooping, sub-alternate, longer than the floral leaves, round, hairy. *Bractes* no other than the floral leaves. *Flowers* cernuous, pale blue. *Calyx* five-leaved; *leaflets* adhering slightly near the base, and at their adhesions forming five sharp ridges, but without the posterior horns of *Borago indica*; nor, like that plant, does it shut over the seed, but becomes expanded. *Corol; divisions* of the border broad-cordate, with their apices sub-filiform. *Filaments* short, and thick, inserted on the mouth of the tube of the corol. *Anthers* sagittate, woolly, each ending in a large twisted thread; sides firmly united into a conical dome over the stigma. *Seeds* four, ovate, smooth on the outside, rough on the inside, where lodged in the receptacle.

3. B. *spinulosa. R.*

Annual, diffuse, dichotomous, armed with depressed bristles. All the *leaves* alternate, sessile, oblong, scabrous. *Peduncles* leaf-opposed, one-flowered.

A native of Bengal, appearing in the cold season.

MENYANTHES. Schreb. gen. N. 263.

Calyx five-parted. *Corol* monopetalous, five-parted. *Capsule* superior, one-celled. *Seeds* many, inserted on parietal receptacles.

1. M. *cristata. R. Corom.* 2. *N.* 105.

Petioles viviparous. *Leaves* round-cordate, repand. *Nectary* triple; *stigma* two-cleft.

Cumuda. *Asiat. Res.* iv. 254.

Sans. Koomoodwutee, Koomoodinee.

I. 460 Tsjeroea-citambel. *Rheed. Mal.* 11. *p.* 57. *t.* 29.

Beng. Chooli.

Teling. Antara Tamara.

A native of pools of sweet water, where it floats, often not reaching the bottom with its roots. Flowering time the wet and cold seasons.

Root annual, fibrous. *Leaves* radical, petioled, cordate, lobes overlapping a little, margins somewhat scolloped, smooth, on the upper side purplish green; size various, the larger from four to six inches long. *Petioles* round, length various, on the upper side about two inches below the leaf there is a viviparous tuberosity, which produces the flowers as well as other leaves and roots, the old leaf and the parent petiole decaying, leave this a new plant, each petiole in succession doing the same. *Peduncles* many, from the above-mentioned tuberosity of the petiole, one-flowered, sufficiently long to raise the flower above the water while expanded, afterwards they drop into the water, and there ripen their seeds. *Flowers* pure white, about an inch in diameter. *Calyx* five-leaved; *leaflets* broad-lanceolate, permanent. *Corol* of one petal; *divisions* of the border oblong, expanding with broad, membranaceous, waved, curled, ragged margins; down the middle of each of them runs a ridge, exactly similar to one half of the divisions themselves, no hair on the flowers. *Nectary* triple: the *exterior* one consisting of white, ramous filaments crowning the mouth of the tube of the corol, as in *Nymphæa*; the *middle* one of five beautiful yellow, glandular bodies, which nearly fill the mouth of the tube, standing alternate with the filaments: and the *interior* one of five hairy, yellow bodies surrounding the base of the germ. *Filaments* inserted into the tube of the corol near its base. *Anthers* oval. *Style* short. *Stigma* two-cleft; *segments* large, and lobate. *Seeds* a little com-

pressed, scabrous. *Receptacles* parietal, opposite, running down the sides of the capsules.

2. M. *indica. Willd. spec.* i. 811.

Petioles viviparous; *leaves* round-cordate. Upper side of the *corol* hairy; *nectaries* none. *Stigma* three-lobed. *Seeds* obovate.

Hind. and *Beng.* Bura-chooli.

Teling. Antara-tamara.

Nedel-Ambel. *Rheed. Hort. Mal.* 11. *p.* 55. *t.* 28.

Cumùd. *Asiat. Res. vol.* iv. *p.* 254. *N.* 30.

Like M. *cristata* it is found floating on sweet water lakes, &c. in Bengal. I never met with it on the coast. Flowering time the cold season.

Leaves petioled, round-cordate; margins slightly waved, somewhat fleshy, smooth, when full grown about a foot or more each way. *Petioles* round, length various; from a tuberosity near the apex, there issue flowers, other leaves, and roots; each leaf therefrom becoming a new plant, as in M. *cristata*. *Calyx* from five to six-parted. *Corol* expanding; *tube* short, yellow; border from five to six-parted, divisions lanceolate, the upper side thickly clothed with long white filaments. *Nectaries* wanting, or minute. *Filaments* as many as the divisions of the calyx and corol, ascending. *Anthers* erect. *Stigma* three-lobed, curled. *Capsule* one-celled. *Receptacles* three, running down the inside of the capsules. *Seeds* numerous, obovate.

FAGRÆA. Schreb. gen. N. 276.

Calyx five-leaved, imbricated. *Corol* infundibuliform, with an imbricated five-cleft border. *Berry* oval, two-celled. *Seeds* many.

1. F. *fragrans. R.*

Arboreous. *Leaves* opposite, lanceolate. *Corymbs* axillary, stamina ascending.

A tree of a moderate size, found by Dr. William Hunter in one garden only on the Island of Pulo Pinang; to which it was originally brought from China. It blossoms in May and June, and ripens its fruit in September and October.

Branches numerous, spreading in every direction. *Leaves* opposite, decussate, patent, short-petioled, broad-lanceolate, taper, obtuse-pointed, entire, nerveless and smooth on both sides; from four to five inches long, and about one and a half broad. *Petioles* short, smooth, enlarged at the base into a stem-clasping ring, which in the dried specimens are encrusted with a clear yellow resin. *Corymbs* peduncled, axillary, nearly as long as the leaves, decompound, decussate, smooth. *Flowers* numerous, large, whitish yellow, fragrant. *Bractes* small, permanent. *Calyx* beneath, deeply five-parted, or rather five-leaved; permanent. *Leaflets* sub-rotund, imbricated, smooth, many times shorter than the tube of the corol. *Corol* one-petalled. *Tube* between companulate and infundibuliform. *Border* contorted, five-parted; *divisions* ovate-oblong, expanding. *Filaments* five, ascending, inserted in the mouth of the tube, and much longer than the corol. *Anthers* incumbent. *Germ* above, ovate. *Style*, the length of the stamens. *Stigma* enlarged, entire. *Berry* oval, a little pointed, size of a currant, smooth, red, pulpy, two-celled. *Seed* several in each cell, angular, and scabrous.

2. F. *elliptica. R.*

Leaves opposite, short-petioled, broad-elliptic, smooth, and firm. *Corymbs* terminal, more than super-decompound. *Tube* of the corol cylindric.

A native of the Moluccas.

PLUMBAGO. Schreb. gen. N. 281.

Calyx gibbous, five-toothed. *Corol* funnel-shaped. *Stamina* inserted into the tops of the five nectarial scales which embrace the germ. *Stigma* five-cleft. *Seed* one, oblong, coated.

1. P. *zeylanica. Willd. sp.* i. 837.

Shrubby. *Leaves* ovate-oblong, smooth. *Racemes* besprinkled with glutinous hair. *Bractes* three, unequal.

Tomba-codivelli. *Rheed. Mal.* 10. 15. *t.* 8.

Chitraca. *Asiat. Res.* iv. 255.

Sans. Pathin, Chitruka; also Vuhni, and all the other names of fire.

Beng. Chitra, Chita.

A perennial shrubby plant, a native of India.

Stems many, jointed, smooth, somewhat declining, ramous, flexuous, from two to four feet long, and about the thickness of a large quill. *Branches* nearly bifarious. *Leaves* alternate, short-petioled, ovate, waved, smooth, entire, from two to three inches long, and one and a half, or two broad. *Petioles* short, stem-clasping, channelled, or sub-winged. *Stipules* none. *Racemes* axillary, and also terminal, covered with much short glutinous hair. *Flowers* pure white. *Bractes* three-fold, one-flowered, the outer one is ten times larger than the lateral one; they are covered with the same gluten as the peduncle of the raceme, sometimes there is a fourth linear bracte pressing the calyx.

2. P. *rosea. Willd. sp.* i. 838. *Asiat. Res.* xi. 175.

Shrubby. *Leaves* ovate-oblong, smooth. *Racemes* smooth; *bractes* three, smooth.

Radix vesicatoria. *Rumph. Amb.* v. 453. *t.* 168.

Schetti codiveli. *Rheed. Mal.* xii. 17. *t.* 9.

Beng. Rukta-chitra; Lall-chita.

Native of Coromandel, and other parts of India.

Perennial, shrubby; *stems*, *branches*, *leaves*, and *petioles* as in the preceding. *Racemes* axillary, and also terminal, smooth. *Flowers* large, of a bright beautiful red. *Bractes* three-

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fold, one-flowered, equal, smooth; the inner or upper two united between the flower and rachis.

I. 464 *Obs.* The specific distinguishing marks between these two species, according to my observation, depend on the racemes and bractes, colour not being a specific mark.

PORANA. Schreb. gen. N. 286.

Calyx five-leaved, growing in the pericarp into scariose wings. *Corol* campanulate. *Germ* one-celled, from two to four-seeded. *Utriculus* one-seeded. *Embryo* erect, curved, and corrugated.

1. P. *Paniculata. R.*

Shrubby, twining. *Leaves* exactly cordate, entire, hoary. *Panicles* terminal, and axillary. *Corol* sub-entire. *Style* short, simple.

A native of the interior parts of Bengal, and particularly plentiful upon the ruins of Gowr, and the Rajamahl hills. Flowering time the cold season; seeds ripe in March.

Stem woody, divided into numerous, very long, scandent, and twining, stout, woody branches, which extend over the largest trees, or whatever else they meet with, their extremities drooping beautifully. *Bark* of the woody parts ash-coloured, and uneven; that of the young shoots clothed with whitish soft down. *Leaves* cordate, entire, fine-pointed, villous on both sides, but particularly so underneath, where they are also hoary, from one to four inches each way. *Panicles* terminal, and from the exterior axills, pendulous or drooping. *Flowers* very numerous, small, pure white. *Calyx* five-leaved, downy; leaflets unequal, but all much shorter than the corol. *Corol* one-petalled, campanulate, margins slightly five-lobed. *Filaments* five, inserted into the bottom of the tube of the corol. *Anthers* linear, half hid. *Germ* ovate, one-celled, ovula four, attached to the bottom of the cell. *Style* short, and simple. *Stigma* of two, large, round, lobes. *Capsule* (*utriculus,*) ovate, one-celled, evalvular, membra-

I. naceous, brittle, villous, size of a small pea, surrounded by the remaining calyx, three of the

465 five leaflets thereof becoming scariose are enlarged into as many oblong, lanceolate wings many time longer than the capsule itself; the other two continue of their original length, but so contracted in breadth as to be filiform. *Seed* solitary, affixed to the base of the capsule. *Perisperm* and *embryo* as in the *Convolvulaceæ*, to which order it belongs.

Obs. A large plant, from thirty to forty feet long, covering a mango tree, is now in full blossom before me, and is certainly a most lovely sight; the long pendulous extremities of the branches, with their numerous panicles of small, white flowers, and hoary leaves, render it a very pleasing object.

2. P. *volubilis. Burm. Ind.* 51. *t.* 21. *f.* 1. *Willd. sp.* i. 843.

Shrubby, twining. *Leaves* cordate, entire, smooth. *Panicles* axillary, and terminal. *Corol* five-cleft. *Style* bifid.

A native of various parts of India, but scarce in Bengal; flowers during the cold season in the Botanic garden, and when in that state is uncommonly beautiful.

Trunk and *branches* ligneous, twining, to a very considerable extent, over trees, &c. *Leaves* alternate, petioled, cordate, entire, smooth, pointed, from two to three inches long, and from one to two broad. *Panicles* axillary, and terminal, drooping; *ramifications* thereof alternate, and downy. *Flowers* numerous, small, white, inodorous, pedicelled. *Bractes* small, villous, several on the base of the pedicels, and one longer than the others under its insertion. *Calyx* of five, oblong, scariose leaflets, which are nearly as long as the corol. *Corol* campanulate; *border* five-cleft; *divisions* oblong, and obtuse. *Filaments* five, inserted near the bottom of the tube of the corol, and nearly as long as the corol. *Germ* ovate, one-celled, containing four ovula, attached to the bottom of their cells. *Style* half two-cleft, one of the divisions shorter. *Stigma* headed, somewhat two-lobed. *Utriculus* surrounded with five, scariose, equally enlarged, permanent leaflets of the calyx; round, size of a small pea, smooth, brown. The

I. rest as in the former species.

466 3. P. *racemosa. R.*

Annual, twining, filiform. *Leaves* cordate, the cauline ones petioled, the floral ones stem-clasping. *Racemes* axillary and terminal. *Corol* five-cleft.

A native of Nepal, from thence introduced by Dr. F. Buchanan, into the Botanic garden, where it blossoms during the dry season.

Stems annual, twining, slender, pretty smooth. *Leaves* cordate, entire, obtuse-pointed, soft, and smooth, the cauline ones are petioled; the floral ones sessile, indeed stem-clasping. *Racemes* axillary, and terminal, long-peduncled, few-flowered. *Bractes*, the lower ones like the floral leaves, but smaller, those of the superior flowers very small. *Flowers* alternate, pedicelled, small, white. *Calyx* five-leaved; *leaflets* sub-lanceolate, growing with the pericarp into five scariose wings. *Corol* sub-campanulate; *tube* short, and rather gibbous; *border* five-parted; *segments* oblong. *Filaments* short, unequal, inserted into the tube of the corol near its bottom. *Anthers* ovate, within the tube. *Germ* ovate, one-celled, containing two seeds, attached to its bottom. *Style* length of the stamens. *Stigma* oval, apex two-lobed. *Utriculus* oval, smooth, of a very delicate, entire, membranaceous texture, surrounded by the five leaflets of the calyx, now enlarged into five scariose, cuneiform wings. *Seed* as in the preceding species.

CONVOLVULUS. Schreb. gen. N. 287.

Calyx five-leaved. *Corol* campanulate. *Germ* two, rarely three-celled. *Stigma* from two to three-lobed. *Capsule,* two or three-celled; *cells* two-seeded. *Embryo* erect, curved; *cotyledons* corrugated.

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N. B. In far the greater number of our East Indian *Convolvuli*, and *Ipomoea*, the stigma consists of two globular heads; each globe an aggregate of minute, roundish, pellucid, glutinous tubercles. In the specific character, therefore I take no notice of the stigma when so formed; it will consequently be understood to consist of two round lobes, when not mentioned. In this genus there is but one species (C. *flagelliformis*,) that can be said to have anything like an entire stigma and in *Ipomoea* only one, viz. I. *phoenicea*. I do not therefore think it would answer any valuable purpose to make a double stigma the essential, generic mark of *Convolvulus*, and a single capitate one, that of *Ipomoea*. But those with an entire seed vessel, may be advantageously formed into a distinct family, which I have done in the next genus, *Lettsomia*.

SECT. I. Twining with undivided Leaves.

1. C. *gangeticus. R.*

Perennial, twining, extensive. *Leaves* round-cordate, entire, obtuse. *Peduncles* solitary, from one to four-flowered. *Leaflets* of the calyx reniform, increasing in size with the capsule, and hiding it. *Corol* with nearly entire margins.

A native of the banks of the Ganges, where it blossoms during the cool season; when its extended branches, and numerous, very large, bright, pink-coloured flowers are highly ornamental; seeds ripe in March.

Stems shrubby, twining up and over trees to a great extent; *young shoots* round, pale green, and a little hairy. *Leaves* petioled, re-entering, round-cordate, entire, often emarginate, nearly smooth above; villous, and dotted underneath, and there strongly marked with many, nearly simple, parallel veins; length and breadth about three or four inches. *Petioles* channelled, nearly as long as the leaves. *Peduncles* axillary, solitary, shorter than the petioles, from one to three-flowered. *Bractes* oblong, opposite, caducous at a very early period. *Leaflets* of the calyx obvolute, reniform, emarginate, with thin, membranaceous edges, increasing in size with the fruit, and covering it completely at all times. *Germ* four-celled, with one ovulum in each cell, attached to the bottom, *stigma* of two round lobes. *Capsules* entirely hid in the calyx, which together with them is the size of a large nutmeg. *Seeds* covered with a dense coat of fine brown down, and hairy round the umbilicus.

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2. C. *semidigynus. R.*

Perennial, twining. *Leaves* cordate, villous. *Peduncles* three or more-flowered. *Style* half two-cleft. *Stigmas* globular.

A native of the Shree-*nugur* mountains, from thence Captain Hardwicke sent seeds to the Botanic garden, where the plants, three years old when this description was taken, are very extensive and in full blossom in December.

Stems woody, twining; young parts villous. *Leaves* alternate, petioled, cordate, and ovate-cordate, entire, pointed, of a very soft, villous texture, particularly underneath; three or four inches long, and about two broad. *Petioles* half as long as the leaves, villous. *Peduncles* axillary, solitary, shorter than the petioles, round, downy, each bearing three or more large, pure white, inodorous flowers. *Bractes* ovate, caducous. *Calyx* downy. *Corol* villous on the outside. *Anthers* with their points bent back towards the bottom of the corol, and their sagittate bases pointing to its mouth. *Germ* bearded. *Style* two-cleft. *Stigma* globular.

3. C. *fastigiatus. R.*

Twining, perennial, smooth. *Leaves* cordate, smooth. *Cymes* long; *peduncles* many-flowered.

A native of the interior parts of Bengal; in flower, and full foliage most part of the year.

Root perennial. *Stems* and *branches* numerous, twining; all the sub-ligneous parts scabrous; *young shoots* running over bushes to an extent of many fathoms, generally tinged with purple. Long runners issue from the top of the root, and spread along the surface of the earth. *Leaves* cordate, in the young luxuriant shoots and runners they are often variously lobate, or have their posterior lobes angular; all are smooth on both sides from two to four inches each way, and like the tender branchlets often tinged with purple, particularly the margins, veins and nerves; there are two round, smooth, rust-coloured glands on the sides of the base of the nerve, where it joins the *petioles*, which are from one to six inches long. *Peduncles* small, deciduous. *Calyx* smooth, leaflets obovate, acuminate, and very small in proportion to the size of the corol. *Stamina* within the tube. *Stigma* of two round lobes. *Capsules* smooth, membranaceous, from two to four-lobed, with a single, dark brown or black, smooth seed in each.

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4. C. *maximus. Willd. sp. pl.* i. 853.

Perennial, twining. *Leaves* ovate, entire, *Peduncles* many-flowered, longer than the leaves. *Seeds* woolly.

A native of Coromandel.

5. C. *malabaricus. Willd. sp. pl.* i. 857.

Perennial, twining, every part smooth. *Leaves* cordate, entire. *Peduncles* many-flowered.

Kattu-Kelengu. *Rheed. Mal.* xi. 105. *t.* 51.

A very extensive, perennial species, found in Mysore by Dr. B. Heyne. In the Botanic garden it began to blossom in February, when the plants were four years old.

Stem and larger *branches* ligneous, and clothed with spongy, uneven, ash-coloured bark; twining over trees &c. to the extent of several fathoms; *young shoots* smooth, deep green; every part, on being wounded, discharges a large quantity of dull-coloured, clammy juice, which instantly becomes of a deep brown colour. *Leaves* long-petioled, cordate, entire, smooth

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on both sides, from three to six inches long, and nearly as broad. *Peduncles* axillary, smooth, many-flowered; sometimes terminal and panicled; *pedicels* clavate. *Flowers* rather small; the bottom of the bell deep purple; *throat* pink with the margins paler, almost white, and slightly ten-lobed. *Calyx* consisting of five, smooth, obtuse, oval leaflets. *Filaments* smooth. *Style* longer than the stamina. *Stigma* of two round lobes.

6. C. *blandus. R. Herb. Banks.*

Perennial, twining, smooth. *Leaves* oblong-cordate, smooth. *Stipules* recurved. *Peduncles* as long as the petioles, many-flowered. *Lobes* of the corol obcordate. *Stigma* of two round lobes.

A native of the mountainous parts of the Circars.

Stem twining, running to a great extent, round, smooth. *Leaves* alternate, petioled, oblong-cordate, pointed, entire, smooth, from three to four inches long. *Petioles* short, channelled, smooth. *Stipules* small. *Peduncles* axillary, as long as the petioles, erect, rigid, round, smooth, many-flowered, umbel-like. *Flowers* large, pure white; *lobes* rounded, and emarginate. *Stigma* two-lobed; *lobes* globular.

Obs. There is a variety of this, if not a distinct species, which differs from it in no other respect, than in being wholly covered with soft hairy down.

7. C. *laurifolius. R.*

Perennial, twining. *Leaves* from ovate to elliptic, with simple and parallel veins. *Peduncles* axillary, many-flowered. *Capsules* fleshy.

A native of Mysore, and from thence introduced into the Botanic garden at Calcutta by Dr. B. Heyne, where it flowers in November. The seeds are ripe in March.

Stems woody towards the base, twining to a very considerable extent. *Bark* of the ligneous parts smooth; that of the young shoots armed with small, stiff, adpressed hairs. *Leaves* alternate, petioled, from ovate to elliptic, with a few adpressed hairs scattered over both surfaces; veins simple and parallel, length from two to six inches. *Petioles* scarcely half

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the length of the leaves; two dark glands at the apex, and hairy like the other tender parts. *Stipules* none. *Peduncles* axillary, shorter than the leaves, round, hairy, many-flowered, the divisions often accompanied with a leaf or two. *Bractes* small, hairy, caducous. *Flowers* of a moderate size, rosy. *Calyx* with equal, ovate, rounded, smooth, segments; their margins coloured. *Corol; tube* or bell sub-cylindric; the inside deep purple; the outside and border pink; *lobes* emarginate, and slightly separated. *Nectary* a yellow, fleshy ring, surrounding the base of the germ. *Filaments* inserted on the bottom of the bell of the corol, there of a purple colour and bearded. *Anthers* ovate-oblong. *Germ* sub-obovate. *Stigma* of two globular lobes. *Capsule* nearly round, size of a large pea, fleshy, two-celled, with two smooth seeds in each.

8. C. *parviflorus. Willd. sp. pl.* i. 856.

Annual, twining. *Leaves* cordate, smooth. *Peduncles* as long as the petioles, many-flowered; *lobes* of the *corol* pointed. *Stigma* two-cleft, *lobes* revolute.

Ipomoea paniculata. *Burm. Fl. Ind. p.* 50. *t.* 21. *f.* 1. (bad.)

A native of hedges, &c. Flowering time the cool season.

Stems twining, annual, round, sometimes slightly hairy. *Leaves* alternate, petioled, exactly cordate, entire, fine-pointed, sometimes very slightly hairy, from one to four inches long. *Peduncles* axillary, rather longer than the petioles, erect, many-flowered, umbel-bearing. *Flowers* pure white, lobes acute. *Stigma* two, clubbed, revolute.

9. C. *calycinus R.*

Perennial, twining, hairy. *Leaves* cordate, acute. *Peduncles* from two to three-flowered. *Exterior* three leaflets of the calyx sagittate, ciliate, as long as the gibbous tube of the corol. *Fruit* drooping.

A native of the interior parts of India; from Cawnpore Captain Hardwicke sent plants

I. 472

to the Botanic garden. where they blossom about the beginning of the cool season. *Stem* twining, perennial; *tender shoots* very hairy. *Leaves* cordate; entire, acute; lobes large, and rounded, a few distinct hairs on the nerves and veins; from three to six inches long, and from two to four broad. *Petioles* hairy, slightly channelled, shorter than the leaves. *Peduncles* axillary, solitary, about as long as the petioles, bearing two, or three alternate, pedicelled, rather small, pure white flowers; after the flowers drop, the pedicels become drooping. *Bractes* cordate, a few scattered over the peduncles, and pedicels. *Calyx*, leaflets as long as the tube, ciliate; the exterior sagittate. *Filaments* smooth. *Germ* on a nectarial pedicel. *Stigma* of two round lobes.

10. C. *obscurus. Willd. sp. pl.* i. 852.

Annual, filiform, sometimes villous. *Leaves* exactly cordate, entire. *Peduncles* jointed, clavate beyond the joint, after the flower decays this part droops; one-flowered, lobes of the corol emarginate. *Seeds* downy.

A native of various parts of India, blossoming in Bengal during the rainy and cool seasons.

Obs. In Dillenius's figure of C. *obscurus*, which is the only species I can compare this plant to, the lobes of the corol are acute; here they are emarginate, hence I conclude they are different. In the *Banksian herbarium* either this or one much like it is named C. *funicularis*.

11. C. *spœhorocephalus. R.*

Annual, twining, villous. *Leaves* cordate-sagittate; lobes rounded. *Flowers* numerous, sessile, on sub-sessile, round, axillary heads.

A native of the interior parts of Bengal. Flowering time from the close of the rains in October till January.

Root annual. *Stem* and *branches* twining, round; *young shoots* clothed with short soft hairs. *Leaves* sagittate-cordate, posterior lobes large, and rounded, both the sides and margins somewhat hairy; length from one to four inches. *Petioles* hairy, channelled, about half as long as the leaves. *Peduncles* axillary, solitary, very short, or almost wanting, bearing many small, rose-coloured, sessile flowers, forming globular heads. *Bractes* or involucres many, linear, recurved. *Calyx*, leaflets as long as the corol, hairy, tapering to a rather long, recurved point. *Corol* having the border slightly marked with ten indentures. *Anthers* half hid in the tube of the corol. *Stigma* of two round lobes. *Capsule* globular, villous, size of a marrow-fat pea, two-celled, with two light-coloured seeds in each. Page Carey Ed. I. 473

Obs. There is a variety of the above, if not a distinct species, with white flowers, in round sessile heads, and having narrower leaves; in other respects they exactly agree; both are natives of Bengal and both are now growing luxuriantly in the Botanic garden. Compare them with *Ipomoea tamnifolia.*

12. C. *pilosus. R.*

Annual, twining, every part very hairy. *Leaves* broad-cordate, entire, or slightly three-lobed, hoary underneath. *Stipules* ear-shaped. *Cymes* long-peduncled. *Calycine leaflets* and bractes ensiform and ciliate.

A native of Mysore; the seeds were sent from thence by Dr. Heyne, to the Botanic garden, where the plants spring up during the rains; blossoming and ripening their seeds during the cold season.

Annual. *Stem* and *branches* twining, extensive, round, very hairy, every part replete with a clammy white juice. *Leaves* broad-cordate, sometimes a little three-lobed, on the upper side a little hairy and deep green, underneath clothed with soft white wool; length from two to six inches, breadth nearly the same. *Petioles* about as long as the leaves, channelled, and hairy. *Stipules* reniform, with callous, ciliate margins; they are always present where there is a peduncle. *Peduncles* axillary, about as long as the petioles, bearing from one to ten or twelve, small, rose-coloured, pedicelled flowers. *Bractes* opposite, with a cordate, peduncle-clasping base; long, taper, recurved points; and ciliate, callous margins. *Flowers* numerous, of a lively pink colour, expanding about an inch. *Calyx; leaflets* linear, acute, longer than the tube of the corol, on the outside glandular, and very hairy. *Stamens* equalling the tube. *Stigma* of two round lobes. *Capsules* globular, half the length of the calyx. *Seeds* four, woolly. I. 474

13. C. *Malcolmi. R.*

Root perennial. *Stems* twining, furrowed. *Leaves* sagittate, with large, angular barbs. *Peduncles* two-flowered. *Bractes* lanceolate. *Stigma* of two linear lobes.

The seeds of this plant were brought from Persia by Major Malcolm, in 1801. The plants raised from them in the Botanic garden, blossomed during the hot season of 1802, when they were about one year old.

Root perennial. *Stems* and *branchlets* twining to an extent of six or eight feet, somewhat furrowed, twisted, and villous, herbaceous. *Leaves* petioled, sagittate; margins a little hairy; smooth on both sides, from one to three inches long. *Barbs* or posterior lobes dilated, spreading, somewhat acute, often dentate, and always angular. *Petioles* scarcely half the length of the leaves, channelled. *Peduncles* axillary, two-flowered, three times longer than the petioles, round. *Pedicels* clavate, as long as the petioles, villous. *Bractes* two, opposite, at the base of the pedicels, lanceolate. *Calycine* leaflets ovate. *Corol* large, of a beautiful lively pink colour, margins almost entire. *Filaments* not half the length of the corol, villous at the base. *Anthers* purple. *Germ* with a yellow ring round the base. *Style* longer than the stamina. *Stigma* of two linear, spreading lobes.

Obs. I must leave the European Botanist to determine how nearly this is allied to *arvensis*, a plant I have never seen in India if this be not it.

14. C. *Medium. Willd. sp. pl.* i. 848. I.

Biennial. *Leaves* linear-lanceolate, stem-clasping, base dilated and dentate. *Peduncles* axillary, from one to two-flowered. *Leaflets* of the calyx lanceolate, cuspidate. 475

Tala-Neli. *Rheed. Mal.* xi. 113. *t.* 55.

Found in various parts of India, in flower during the rainy and cool seasons.

15. *tridentatus. Willd. sp. pl.* i. 848.

Annual, leaves short-petioled, sub-cuneate, with sagittate, acutely dentate, posterior lobes, and a somewhat retuse, or rounded tridentate apex. *Peduncles* filiform, one, rarely two-flowered.

Evolvulus tridentus. Burm. Ind. 77. *t.* 16. *f.* 3.

Sendera-clandi. *Rheed. Mal.* xi. 133. *t.* 65.

Found common on the coast of Coromandel, Malabar, &c. Flowers during the rainy season in Bengal.

16. C. *bicolor. Willd. sp. pl.* i. 850.

Perennial, twining, hairy. *Leaves* cordate, and generally somewhat angular, downy. *Peduncles* longer than the leaves, from one to four-flowered. *Bractes* lanceolar. *Calycine leaflets* acute and very unequal.

Hind. Jurud-kulmi.

Is a species common in hedges, &c. over the coast of Coromandel. Flowers during the rains.

Stems twining, herbaceous, round, covered with soft hair, or down, from one to two fathoms long. *Leaves* alternate, petioled, broad-cordate, sometimes slightly and irregularly lobed, downy, from one to four inches long. *Peduncles* axillary, twice as long as the leaves,

Page Carey Ed. slender, erect, downy, ending in a small head of from two to four sessile flowers. *Bractes* lanceolate, one or two pressing on each of the calyces. *Flowers* middle-sized, yellow, bottom of the bell, deep purple. *Stigma* of two globular heads. *Capsules* hairy, four-celled. *Seeds* black, one in each cell.

I. 476 *Obs.* Since writing the above description I have often met with plants, having one, and two-flowered peduncles. It is therefore very likely that those varieties include both C. *sublobatus*, and *bicolor*.

17. C. *Turpethum. Willd. sp. pl.* i. 859.

Perennial. *Leaves* from broad-cordate, to arrow-shaped, angular. *Stems* three or four-angled. *Peduncles* many-flowered. *Stigma* of two round lobes. *Capsules* inflated, transparent, four-celled, one-valved.

Sans. Synonyma.

Beng. Teoree, Dood kulmi.

Teling. Tella-tagada.

Common in hedges, &c. Flowering time the rainy season.

Root perennial. *Stems* twining, several fathoms long, from three to four-sided, angles membrane-winged, a little downy, perennial. *Leaves* alternate, petioled, form various, from cordate to linear, all are pointed, and lobate, or angular; behind a little downy. *Stipules* none, but instead thereof glands. *Peduncles* axillary, many-flowered. *Flowers* large, white. *Bractes* oval, concave, falling. *Germ* elevated on a large glandular body. *Stigma* two-lobed. *Capsules* involved in the dry calyx, absolutely four-sided, four-celled, one-valved; apex transparent. *Seeds* round, black, one in each cell, free.

Obs. The bark of the roots is by the natives employed as a purgative, which they use fresh, rubbed up with milk. About six inches in length of a root as thick as the little finger, they reckon a common dose. Cattle do not eat the plant.

SECT. II. *Twining with divided or compound Leaves.*

18. C. *vitifolius. Willd. sp. pl.* i. 864.

Perennial, twining, hairy. *Leaves* cordate, five-lobed, serrulate-dentate. *Peduncles* as long as the leaves, from three to six-flowered. *Leaflets* of the calyx obovate.

I. 477 A native of hedges and forests; flowering in the cold season.

Stem twining, perennial, round, very hairy, two or three fathoms long, the extremities of the branches are often highly coloured, and less hairy than the other parts. *Leaves* alternate, petioled, broad-cordate, frequently five-lobed, remotely serrate-dentate, a little downy; size very various, being from one to six inches long. *Petioles* of the longer inferior leaves equalling these in length; those of the floral leaves short. *Peduncles* axillary, about as long as the floral leaves from three to six-flowered. *Flowers* large, bell-shaped, very beautiful, of a bright lively yellow. *Calyx* hairy. *Anthers* becoming spiral after opening the extremities. *Stigma* of two round lobes.

19. C. *dentatus. Willd. sp. pl.* i. 849.

Twining, and creeping, muricated. *Leaves* cordate, three-lobed, dentate. *Peduncles* from two to three-flowered. *Leaflets* of the calyx obovate.

In Bengal it is more luxuriant than on the coast, leaves generally entire, stems, &c. generally smooth, and with longer, many-flowered peduncles.

Teling. Talla-antootiga.

A native of hedges, thickets, &c. Flowering time the rainy season.

Stems and *branches* twining, or creeping, filiform, often perennial, coloured, armed with small inoffensive prickles, otherwise smooth, one or two fathoms long. *Leaves* alternate, petioled, cordate, three-lobed, toothed, smooth, from one to two inches long. *Petioles* prickly, branch-like. *Peduncles* axillary, as long as the petioles, and like them, from two to three-flowered. *Flowers* short-pedicelled, small, yellow. *Filaments* woolly at the base. *Stigma* single, large, globular.

20. C. *copticus. Willd. sp. pl.* i. 863.

Herbaceous, procumbent, angled. *Leaves* palmate. *Lobes* lanceolate, serrate. *Flowers* terminal, on minute branchlets. *Calyces* murexed.

I. 478 A native of pasture ground, flowering in the rains.

Stems procumbent, rarely twining, herbaceous, angled from the insertion of the leaves, from one to two feet long. *Leaves* alternate, short-petioled, palmate, scarcely an inch long, lobes from five to seven, divided to near the base, lanceolate, serrate, smooth, the inner ones smallest. *Stipules* like the leaves, but small, and sessile. *Flowers* terminal, small, white. *Calyx* murexed. *Lobes* of the corol semi-orbicular with a point.

21. C. *paniculatus. Willd. sp. pl.* i. 865.

Root tuberous, perennial, twining, smooth. *Leaves* palmate. *Cymes* long-peduncled, capsules four-celled. *Seeds* woolly.

Pal-modecca. *Rheed. Mal.* xi. 101. *t.* 49. (Exclude *Modecca. Rheed. Mal.* viii. 39. *t.* 20.)

Ipomoea *mauritiana. Jacq. Collect.* iv. 206.

Beng. Bhoomi-koomra.

Teling. Matta-pal-tiga.

A native of hedges, thickets, &c. Flowering time the wet season.

Root perennial, tuberous. *Stems* and *branches* perennial; *young shoots* round and smooth. *Leaves* alternate, petioled; palmate, from three to six inches each way. *Lobes*

generally five, divided little more than half way down, broad-lanceolate, entire, smooth. *Peduncles* axillary, erect, as long as the petioles, sub-umbel-bearing. *Flowers* numerous, large, of a beautiful dark reddish purple. *Capsules* four-celled. *Seeds* woolly, all round. Page Carey Ed.

Obs. Cattle eat it. The root is cathartic, and as such used by the natives where it grows.

22. *pedatus. R.*

Perennial, twining, smooth. *Leaves* pedate-triternate, leaflets lanceolate, entire. *Stipules* filiform-pedate. *Peduncles* one-flowered; and with the calyx warted. I. 479

Native place uncertain, as it has accidently sprung up in the Botanic garden amongst plants received from friends in the vicinity of Calcutta. The flowers appear in profusion during the cool season; they are pretty large, of a bright sulphur colour and the stigma is of two round lobes.

23. C. *digitatus. R.*

Perennial, twining, spinulous. *Leaves* digitate. *Peduncles* from three to four-flowered. *Corols* almost funnel-shaped. *Stigmas* of two round lobes. *Seeds* woolly on the convex side.

A native of hedges, &c. Flowering time the cold season.

Stems and *branches* twining, perennial, round, with here and there a few small inoffensive prickles. *Leaves* alternate, petioled, digitate. *Leaflets* generally five, broad-lanceolate, entire, smooth, the inferior ones smallest. *Petioles* channelled, armed as the branches, as long as the leaflets. *Peduncles* axillary, about as long as the petioles, from three to four-flowered. *Flowers* pretty large, between campanulate and funnel-formed, a pale bluish purple. *Stigma* two-lobed. *Seeds* woolly on their outer angles.

Obs. This is one of the most beautiful *Convolvuli* in India.

24. *hirsutus. R.*

Annual, twining, extremely hirsute. *Leaves* digitate; *leaflets* five, sessile, broad-lanceolate, entire. *Peduncles* from one to three-flowered. *Calyx* very hairy, entirely hiding, until ripe, the cordate, smooth, four-celled capsule.

A native of the interior parts of Hindoosthan; flowering time the close of the rains, and cold season.

Stem and *branches* annual, twining, very hirsute; hairs somewhat bristly, issuing from little brown glands; general extent of the plant from six to twelve feet. *Leaves* petioled, digitate. *Leaflets* five, sessile, lanceolar, acute, entire, hairy, about three inches long by one broad. *Petioles* round, as long as the leaflets, hirsute. *Peduncles* axillary, sometimes as long as the petioles, hirsute, bearing from one to three, rarely more, middle-sized, pure white flowers, on long hirsute, proper pedicels. *Bractes* at the base of the pedicels only, sub-lanceolate, recurved, hairy. *Leaflets* of the *calyx* oblong, permanent; the exterior three large, and extremely hirsute. *Corol* campanulate, white; *tube* as long as the calyx. *Stamens* smooth. *Stigma* of two round lobes. *Capsule* broad-cordate; *valves* thin, and smooth on both sides. *Seeds* three or four, smooth. I. 480

25. C. *heptaphyllus. R.*

Perennial, twining, smooth. *Leaves* digitate; *leaflets* seven, lanceolar, entire. *Peduncles* filiform, spiral, pendulous, one, rarely three-flowered.

Of what part of India this is a native I cannot certainly say. It has appeared in one of the nurseries in the Botanic garden at Calcutta. The seed was most likely received accidentally with some other sorts. Here it flowers during the latter part of the rains, and cold season.

Stems and *branches* twining, perennial, long, slender, round and smooth. *Leaves* petioled, digitate; *leaflets* generally seven, sessile, lanceolar, entire, smooth; from one to two inches long. *Petioles* slightly channelled, length of the leaflets. *Peduncles* axillary, solitary, very slender (filiform), twisted, pendulous, longer than the petioles, generally one-flowered, rarely two or three, though three seems the natural number, and the two lateral ones for the most part prove abortive. *Bractes* few, and minute. *Calyx*; *leaflets* ovate, rugose on the outsides. *Corol* small, pale pink, with the bottom of the bell deeper coloured. *Stigma* of two round lobes.

Obs. A beautiful, delicate, though extensive plant, and uncommonly interesting on account of its slender, pendulous, spiral peduncles, with its pretty, small pink flowers, standing erect on its thickened, curved apex.

SECT. III. *Prostrate, or creeping; not twining.* I. 481

26. C. *reniformis. R.*

Perennial, very ramous, and creeping close on the ground. *Leaves* reniform, emarginate, long-petioled. *Peduncles* many-flowered. *Inner* three leaflets of the calyx two-lobed, and ciliate. *Lobes* of the corol bifid.

A native of Bengal. Flowering time the cool season. Burman's figure of *Evolvulous emarginatus, Flora Indica*, 77. *t.* 30 *f.* 1. is very much like this; if the flowers were more numerous, and their petioles longer, I should consider them the same; they ought to be compared, when an opportunity offers.

Stems and *branches* numerous, always creeping flat on the ground, and striking innumerable roots from the joints, smooth, and slender as a pack-thread. *Leaves* long-petioled, reniform, emarginate, and often slightly scollop-toothed, smooth; size very various; often of a dark [illegible] *Peduncles* [illegible] smooth. *Pedicels* axillary, much shorter than the petioles, many flowered. *Flowers* [illegible] small, bright yellow, opening late

Page Carey Ed. in the forenoon, and shutting early in the evening. *Calyx* the two exterior leaflets smaller, oblong, and pointed; the inner three broad, wedge-shaped, with a ciliate, two-lobed, apex. *Corol* with its five lobes deeply divided. *Filaments* smooth. *Stigma* two-lobed; *lobes* roundish. *Capsule* round, size of a small pea, rather longer than the calyx, tomentose, two-celled. *Seeds* light brown, minutely dotted.

Obs. In some soils it is found entirely of a dark purple or ferruginous colour.

27. C. *flagelliformis. R.*

Perennial, creeping. *Leaves* reniform, cuspidate, smooth, with two glands at the base. *Peduncles* from three to five, flowered. *Calyx* transversely rugose. *Stigma* transversely oval, somewhat two-lobed.

I. 482 Bel-Adamboe. *Rheed. Mal.* xi. *p.* 119. *t.* 58. may be this plant though in some respects they will be found to differ a little.

Ipomoea *repens. Lamarck illust.* i. 497.

A native of the Mysore country, from thence the seeds were sent by Dr. B. Heyne to the Botanic garden, where the plants thrive luxuriantly, and are in blossom most part of the year.

Stem and *branches* creeping, perennial, long, simple, slender, and smooth. *Leaves* reniform, or cordate-reniform, with a small terminal bristle for a point, smooth on both sides, and as in C. *brasiliensis*, having two glands on the under side of the base; breadth from two to three inches, and the length considerably less. *Petioles* as long as the leaves, channelled, swelled at the insertion, and there marked with some glandular knobs. *Peduncles* axillary, solitary, larger than the petioles, round, smooth, bearing from three to six, large, pure white flowers. *Leaflets* of the *calyx* ovate, fleshy; outside transversely rugose. *Stigma* of one, transversely oval, large lobe. *Capsule* with generally four, light brown, smooth seeds.

28. C. *repens. Willd. sp. pl.* i. 874.

Annual, creeping, or floating, piped, smooth. *Leaves* oblong-cordate, posterior lobes angular. *Peduncles* shorter than the petioles, from three to six-flowered. *Corol* sub-infundibuliform.

Ballel. *Rheed. Mal.* xi. *p.* 107. *t.* 52.

Olus-vagum. *Rumph Amb.* v. 419. *t.* 155. *f.* 1.

C. *reptans. Willd. sp. pl.* i. 875. is probably this plant, or a variety of it.

Beng. Kulmi-shak.

Teling. Tootie-kura.

A native of standing sweet water, or places where water lately stood, very common.

I. 483 *Stems* creeping, or floating on the water, annual, or biennial, round, piped, jointed, smooth, many fathoms long. *Leaves* alternate, long-petioled, oblong-cordate, pointed, entire, smooth, from four to six inches long. *Peduncles* axillary, erect, round, smooth, from three to six-flowered. *Flowers* large, beautiful rose colour. *Lobes* triangular. *Tube* of the corol between bell and funnel form. *Base* of the filaments woolly. *Stigma* two-headed.

Obs. The tender tops and leaves are eaten in stews by all ranks of the natives, and much esteemed.

29. C. *Batatas. Willd. sp. pl.* i. 853.

Root tuberous. *Stems* creeping, rarely twining. *Leaves* cordate, angle-lobed. *Peduncle* many-flowered. *Segments* of the calyx oblong, smooth, acute.

Beng. Lal-shukur-kunda-aloo, the red variety; and Suffet-shukur-kunda-aloo, the white.

Kappa-kelengu. Rheed. Mal. vii. 95. *t.* 50.

The red sort is in very general cultivation all over the warmer parts of Asia and very deservedly esteemed one of their most palatable and nutritious roots. I suspect C. *edulis*, *Thunb. japan.* 84, is the same or a variety.

30. C. *cespetosus. R.*

Annual, or biennial, creeping. *Leaves* linear-lanceolate, smooth. *Peduncles* longer than the petioles, from one to four-flowered. *Calyx* smooth. *Capsules* one-celled, four-seeded.

A native of the dry lands of Dinagepore and Rungpore, from thence the seeds were sent, by Dr. Carey, to the Botanic garden at Calcutta, where they blossom during the cold season.

Root generally annual, though sometimes biennial. *Stem*; I cannot say there is any thing like one, but numerous, slender, round, cespitose, somewhat villous, and, in some parts, even I. hairy branches, spread close on the earth, and strike root; length of the larger branches from 484 one to three feet. *Leaves* petioled, linear-lanceolate, smooth, entire, from two to three inches long, and less than half an inch broad. *Petioles* clothed with long, soft, brown hairs. *Peduncle* axillary, longer than the petioles, hairy near the base, bearing from one to four, small, very pale-yellow flowers, but when one, or two, these are accompanied with the rudiment of one or two more, and some small, cordate smooth bractes. *Calyx*; *leaflets* oval, equal, smooth, concave, with callous, smooth, dark green margins. *Stigma* of two round lobes. *Capsules* globular, smooth, size of a pea, one-celled, four-seeded. *Seed* smooth, deep brown.

31. C. *stipulaceus. R.*

Creeping, smooth, with apices twining. *Leaves* cordate-sagittate, with lobes repand. *Stipules* recurved. *Peduncles* many-flowered. *Calyx* smooth. *Lobes* of the corol obcordate. *Seed* woolly.

A native of Chittagong, sent from thence by Mr. W. Roxburgh to the Botanic garden at Calcutta, where it flowers about the beginning of the hot season.

Root perennial. *Stem* and *branches* creeping, round, smooth, extremities twining; length from one to two fathoms, or even more. *Leaves* petioled, cordate-sagittate, with posterior lobes (barbs) often very much drawn back on both sides, point rather obtuse, with a minute bristle; length

from two to three inches. *Petioles* channelled, from one to two inches long. *Stipules* two, stout, inoffensive, recurved, acute, at the base of the petiole. *Peduncles* axillary, solitary, about as long as the petioles, round, smooth, somewhat clavate, bearing from three to six or even more, large, pure white flowers. *Pedicels* clavate, shorter than the peduncles, round, smooth. *Calyx; leaflets* ovate, equal, concave, smooth, and somewhat transparent. *Corol; lobes* of the border large, obcordate. *Nectary* a pentagonal cup surrounding the base of the germ. *Style* much longer than the stamens. *Stigma* of two round lobes. *Capsule* ovate, smooth. *Seed* covered with much soft, deep olive-coloured wool. Page Carey Ed. I. 485

32. C. *pentagonus. R.*

Perennial, angular, creeping. *Leaves* cordate-sagittate, with the posterior lobes rounded, but somewhat angular. *Peduncles* rigid, umbelliferous. *Calyx* smooth. *Lobes* of the corol circular. *Seeds* hairy.

A native of the Moluccas; and from thence introduced into the Botanic garden at Calcutta in 1800; where it blossoms during the cold and hot seasons.

Root perennial. *Stems* and *branches* creeping, pentangular; young parts villous, and sometimes twining, though not readily; length of the whole plant from two to three fathoms. *Leaves* petioled, the lower ones broad-cordate-sagittate; the superior ones narrow-sagittate; in all the posterior lobes are large, and rounded, though frequently a little angular; margins generally entire; both sides very villous; *length* from one to four inches. *Petioles* scarcely half the length of the leaves, channelled, villous, at the base swelled on each side into two glandular, stipulary knobs. *Peduncles* axillary, solitary, erect, rigid, clavate, villous, about as long as the petioles, supporting a trichotomous, corymbiform umbel, of many, pretty large, pure white, inodorous flowers. *Pedicels* shorter than the peduncles, but like them clavate, and villous. *Bractes* many, caducous, and of various sizes. *Calyx; leaflets* ovate, concave, slightly villous, much shorter than the tube of the corol. *Corol* perfectly campanulate. *Border* divided into five semi-circular lobes. *Stamina* hid in the tube. *Style* about as long as the stamens, of two round lobes. *Seed* dark-brownish black, and covered with much soft hair, of the same colour.

33. C. *bilobatus. R.*

Perennial, creeping. *Leaves* two-lobed, smooth. *Peduncles* from three to six-flowered. *Lobes* of the stigma round. *Seed* woolly.

Convolvulus marinus. *Rumph. Amb.* v. 433. *t.* 159. *f.* 1. I.

A native of the Moluccas, from whence the roots were brought to the Botanic garden at Calcutta, amongst the earth in which some spice plants came. They blossom during the hot season. 486

Stems and *branches* creeping, perennial, striking root at the joints chiefly; *young shoots* smooth, polished, pale green; length from one to three fathoms. *Leaves*, petioles erect, two-lobed, or of a deeply emarginate, round, obcordate shape, margins entire, and very smooth on both sides, about three inches long, by two and a half broad. *Petioles* round, slightly channelled, smooth, with two very conspicuous reddish glands at the apex. *Peduncles* axillary, erect, slender and longer than the petioles; bearing from one to seven, or even nine, large, purple flowers on their proper, clavate striated, pedicels. *Calyx; leaflets* ovate, somewhat three-ribbed, and transversely rugose. *Nectary*, a glandular ring round the base of the germ. *Filaments* enlarged, woolly at the base. *Stigma* of two round lobes. *Capsules* vertically compressed, smooth, lined with a tough pellicle. *Seed* clothed with much soft, short, dark brown hair.

Obs. A variety, if not a distinct species has been reared in this garden, from seed received from China. It flowers in April and May; the peduncles one-flowered, the leaflets of the calyx scarcely rugose, with subulate points; when wounded milky. In size, colour of the flowers, leaves, &c. they are the same.

34. C. *Pes-capræ. Willd. sp. pl.* i. 876.

Perennial, creeping to a great extent. *Leaves* long-petioled, two-lobed, smooth, at the base two glands. *Peduncles* axillary, solitary, one or two-flowered.

Beng. Chhagul-khooree.

Hind. Dopati-luta.

Schovanna-Adamboe. *Rheed. Mal.* xi. 117. *t.* 57.

A native of the sandy shores of India; where it blossoms and ripens its seed most part of the year. I. 487

Stems perennial, columnar, and smooth, never twining, but creeping to a very great extent over the sandy shores of the sea coasts, where the plant is chiefly found. *Leaves* long-petioled, deeply two-lobed, smooth, with two large coloured glands at the base. *Peduncles* axillary, solitary, length of the leaves, generally one or two-flowered. *Flowers* large, red-purple. *Calyx; leaflets* oblong, acute, transversely rugose on the outside toward the base. *Stigma* of two round lobes. *Seeds* densely clothed with a dark brown, plush-like pubescence.

Obs. This plant is very useful where it naturally grows, helping to bind the loose sands, and in time render it sufficiently stable to bear grass. Goats, horses, and rabbits eat it.

LETTSOMIA. R.

Calyx five-leaved. *Corol* from campanulate to infundibuliform. *Germ* two-celled. *Stigma* two-lobed. *Berry* dry or succulent, two-celled; *cells* one or two-seeded. *Embryo*

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erect, curved; *cotyledons* corrugated.

In honour of John Coakley Lettsom, M. D. F. S. A. author of numerous valuable works, which more than prove him fully entitled to this mark of respect.

The genus is composed of very powerful, extensive, twining, perennial, lactescent plants; with simple leaves and axillary inflorescence.

SECT. I. *Corols campanulate.*

1. L. *splendens. R.*

Perennial, twining. *Leaves* cordate-oblong, parallel, veined, sericeous underneath. *Corymbs* axillary. *Berry* highly coloured and embraced by the permanent crimson *calyx.*

A most beautiful plant, far exceeding every other species I have yet met with; a native
I. of Chittagong, where it blossoms and ripens its seeds at various times of the year.
488 2. L. *aggregata. R.*

Perennial, twining. *Leaves* cordate, woolly underneath. *Peduncles* axillary, supporting four sessile heads of involucred flowers. *Stigma* and *style* much longer than the corol. *Berry* four-seeded.

Teling. Yerra-k*utha.*

A native of various parts of the coast of Coromandel. Flowering time the cool season; *seed* ripe in March and April.

Stems ligneous, twining to a great extent; *young shoots* round, clothed with soft, white pubescence; and discharging a milky juice when wounded. *Leaves* petioled, round-cordate, entire, smooth above, woolly underneath; from three to six inches long, and from two to five broad. *Peduncles* axillary, generally solitary, longer than the petioles, round, woolly; each supporting an umbellet of four, cruciform, sessile heads of small, pink-coloured, sessile flowers with a single sessile one in the centre; surrounded with several, roundish woolly bractes, (involucres,) with incurved margins. *Calyx; leaflets* unequal, cuneiform, woolly on the outside. *Corol* campanulate. *Border* deeply cut into five, emarginate lobes. *Stamina* much longer than the corol, and of the same colour. *Germ* surrounded with a particularly large, yellow, nectarial ring. *Style* as long as the stamina. *Stigma* of two, large, round lobes. *Berry* round, covered with a soft, tough, smooth, fleshy, bright red envelope, about the size of a marrow-fat pea, two-celled, with two seeds in each, when all come to maturity. The remaining calyx is now enlarged, and clothed on the outside with sericeous down, while the smooth bright red, inner surface thereof adds much to the beauty of this elegant species when in fruit. *Seeds* smooth, pale ash-coloured. *Embryo* as in the genus.

I. 3. L. *nervosa. R.*
489 Shrubby, twining to a great extent. *Leaves* broad-cordate, sericeous underneath, veins parallel. *Peduncles* longer than the petioles, umbelliferous. *Stigma* round, of two lobes. *Capsules* one-valved, one-celled.

Convolvulus nervus. *Burm. Ind.* 48. *t.* 20. *f.* 1.

Samudra-stjogam. *Rheed. Mal.* xi. 125. *tab.* 61.

Beng. Bis-taruk*a.*

Teling. Kokayt*i.*

A native of forests, hedges, &c. it is one of the largest species of the *Convolvulacea* I know. Flowering time the wet and cold seasons.

Stems twining, woody, of a very great length, running over the highest trees; young parts covered with white silky down. *Leaves* petioled, broad-cordate, entire; many large, distinct, opposite nerves running parallel; the upper side pretty smooth, the under side covered with much soft, white silky hair; from four to twelve inches each way. *Petioles* shorter than the leaves, tapering, round, at the apex on each side is a large, flat, scabrous, dark-coloured gland. *Peduncles* axillary, like the petioles, but longer, bearing an erect umbel, of many flowers. *Flowers* large, of a deep rose-colour. *Bractes* many, large, oval, white, waved, pointed, caducous. *Stigma* two, globular. *Berry* globular, smooth, entire, not opening in a regular manner, but crumbling to pieces.

Obs. Seeds received from England, sent to me by the late Honourable Charles Greville, under the name *Convolvulous speciosus,* produced this identical plant. *Stigma,* &c. &c. perfectly the same as in the original Bengal plant.

4. L. *argentea. R.*

Perennial, twining. *Leaves* cordate, parallel-veined, sericeous underneath. *Peduncles,* as long as the petioles, leafy; *bractes* lanceolate, sericeous.

Found in forests about Calcutta. I never saw it on the coast of Coromandel.

I. *Beng.* Sumoodra-shok*a,* chhot*a* Bistaruk*a.*
490 *Stems* twining, perennial. *Leaves* petioled, broad-cordate, entire, with many parallel veins, as in C. *nervosa;* the upper side pale green, with depressed hairs, the under side covered with much bright, silver-coloured, silky down; about four inches long each way. *Petioles* erect, round, hairy, length of the leaves; at the apex on each side is a green gland, as in C. *nervosus. Peduncles* axillary, erect, round, hairy, umbel-bearing. *Bractes* lanceolate, silky. *Flowers* many, large, of a beautiful rich pink colour. *Nectary,* a fleshy ring round the base of the germ. *Stamens,* base of the filaments woolly. *Berry* soft, and pulpy, four-seeded.

Obs. The following marks distinguish this species from *nervosa,* to which it is nearly allied:

1*st.* The leaf-bearing umbel,

2*d.* The bractes. In this species they are lanceolate, and not waved, in that oval and much waved. Page Carey Ed.

3*d.* The flowers of this species are larger, and the leaves much smaller than in that.

4*th.* Here the veins are few, and alternate; there many, large and opposite.

5*th.* This produces a soft berry; that a perfectly dry capsule.

5. L. *setosa. R.*

Perenuial, twining, tender parts armed with adpressed bristles. *Leaves* round-cordate, acuminate, parallel-veined, scaly underneath. *Peduncles* panicled. *Corols* exactly campanulate, with a small, sub-entire border. *Berry* hid in the large, fleshy calyx.

A native of the northern Circars. Flowering time the cool dry months of December and January.

Stems ligneous, twining. *Branches* numerous; *young shoots* clothed with stiff, short, silvery, adpressed bristles. *Leaves* petioled, round cordate, entire, acuminate; *veins* parallel, elevated, and simple; the upper surface smooth, deep green, the under one whitish, with numerous minute, pellucid scales and a few remote, adpressed, stiff hairs; from two to eight inches long, and nearly the same in breadth. *Petioles* considerably shorter than the leaves, bristly. *Panicles* axillary, solitary, long-peduncled, corymbiform. *Peduncles* and *ramifications* whitish, with numerous, adpressed, whitish bristles. *Flowers* numerous, pretty large, sessile on the ramifications of the panicle, pink-coloured. *Bractes* several round the base of each calyx, like a calycle, oval, concave, rigid, bristly. *Calyx; leaflets* oval, obtuse, nearly equal, permanent; the outside bristly. *Tube* of the *corol* exactly campanulate, the outside somewhat bristly. *Border* almost entire, spreading. *Germ*, the lower half invested in a large yellow ring. *Style* about as long as the stamina. *Stigma* of two round lobes. *Berry* ovate, smooth, shining red, hid within the leaflets of the permanent calyx. I. 491

6. L. *strigosa. R.*

Perennial, twining, every part covered with harsh brown hairs. *Leaves* cordate, entire, with many parallel nerves. *Peduncles* elongated. *Flowers* aggregate.

A native of the eastern part of Bengal, and from thence sent to the Botanic garden at Calcutta, by Dr. Buchanan. Blossoms about the close of the rains.

Stem woody, twining up, and over high trees. *Bark* rough. *Young shoots* very hairy. *Leaves* alternate, petioled, cordate, entire, nerves many, and parallel, very hairy on both sides; from four to six inches long, and three or four broad. *Peduncles* axillary, round, hairy, longer than the petioles, each supporting a few large, sessile, rose-coloured, campanulate flowers, surrounded with many broad-lanceolate, hairy bractes. *Stigma* of two, large, globular lobes.

7. L. *cuneata. R.*

Perennial, twining. *Leaves* cuneate-emarginate; villous underneath. *Peduncles* three-flowered, much shorter than the leaves. I. 492

Convolvulus *cuneatus. Willd. spec.* i. 873.

Some plants of this uncommonly elegant species, were brought from the Mysore country, by General Martin in 1792. He gave one of them to the Botanic garden at Calcutta, which has been multiplied by layers, and blossoms about the close of the rains in September, and October.

Stems woody, twining, of very considerable extent. *Bark* smooth, dark grey. *Young shoots* covered with short depressed hairs. *Leaves* alternate, short-petioled, cuneate, emarginate, entire, smooth above, a little hairy underneath; general length about two inches. *Peduncles* axillary, solitary, three-flowered, round, villous, about three quarters of an inch long. *Pedicels* shorter than the peduncles, always consisting of an opposite incurved pair, with a solitary shorter one in the centre. *Bractes* linear. *Calyx, leaflets* ovate, a little villous. *Corol* large, of a beautiful deep bright purple colour. *Tube* ample; the five lobes of the border emarginate, which makes the whole appear ten-lobed. *Nectary*, a fleshy ring round the base of the germ. *Filaments* broad, and hairy, at the base. *Stigma* of two, round heads. *Berry* oblong, dry, one-celled. *Seeds* from one to four, immersed in a little dry farinaceous matter.

Obs. This when in blossom, is one of the most beautiful of the whole order; the large, very bright, deep purple flowers make it particularly conspicuous amongst its own deep green leaves, and this is much augmented by making it run over any other stout plant with dense deep green foliage.

8. L. *cymosa. R.*

Perennial, twining. *Leaves* round, reniform-cordate. *Peduncles* larger than the leaves. *Flowers* many, in an involucred, dense cyme. *Berry* globular.

An extensive, stout, perennial, twining plant, a native of the Malabar mountains; from Wynaad the seeds were sent, by Captain Dickinson, to the Botanic garden at Calcutta, where the plant flowers during the cold season. The *seeds* ripen four or five months afterwards. I. 493

Stem and large *branches* woody, twining; *young shoots* villous. *Leaves* round, reniform-cordate, villous; from three to four inches long, and from three to five broad. *Peduncles* axillary, solitary, generally longer than the leaves, each supporting a yellowish, dense cyme of many sub-sessile, large, pale pink flowers; embraced by one or more unequal small leaves, the largest of which are shaped like the other leaves, and peduncled; the smaller ones nearly round, and sessile. *Calyx*, the exterior leaflets nearly round; the inner ones ovate-oblong; all are more or less recurved, and villous. *Corol* sub-infundibuliform, the outside villous. *Style* much longer than the stamens. *Stigma* of two round, bright purple lobes. *Berry* smooth, yellow, soft, pulpy, round, size of a small cherry; with from one to four, smooth, white seeds. *Seeds* and *embryo* as in other *convolvulaceæ*, viz. a descending radicle with the lobes irregularly folded, and invested while fresh, in something like a thin perisperm.

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9. L. *pomacea, R.*

Perennial, twining. *Leaves* round-cordate, emarginate. *Peduncles* dichotomous, from three to five, or seven-flowered. *Bractes* cuneate. *Berry* succulent, four-seeded.

Ipomoea *zeylanica. Gært. carp.* ii. 482. *t.* 178.

A native of Mysore, from thence the seeds were sent by Dr. Buchanan to the Botanic garden, where the plants thrive well, and blossom during the hot and rainy seasons; the seeds ripen about eight months afterwards.

Stems twining, ligneous, as thick as a man's arm; *young parts* covered with tolerably smooth, ash-coloured *bark. Branches* numerous, twining, very extensive; *young shoots* clothed with short, white depressed hairs. *Leaves* petioled, round-cordate, with the margin waved,
I. emarginate, both sides clothed with short hair; veins almost simple and parallel; length from
494 two to four inches, the breadth nearly equal to the length. *Petioles* round, shorter than the leaves, hairy; an obscure green gland on each side of the apex. *Peduncles* axillary, solitary, longer than the petioles, round, hairy, dichotomous; each division bearing one, two, or three large rose-coloured flowers, with one in the fork. *Bractes* several, cuneate, hairy. *Calyx; leaflets* oval, obtuse. *Corol,* tube somewhat gibbous, a little hairy on the outside. *Stigma* of two round lobes. *Berry* spherical, smooth, size of a cherry, when ripe yellow, consisting of soft yellow pulp, containing four large, roundish, smooth, white seeds.

SECT. II. *Corol infundibuliform.*

10. L. *bona-nox. R.*

Perennial, twining. *Leaves* round-cordate. *Peduncles* three-flowered; *stigma* of two cylindric lobes. *Berry* dry, ovate-oblong, one-celled, from one to four seeded.

Beng. Kulmi-luta.

Clove-scented creeper. *Asiat. Res.* iv. 257.

Midnapore creeper, its common English name.

Ipomoea bona-nox. *Gært. carp.* ii. 247. *t.* 134. agrees better with the seed vessel of *convolvulus nervosus, Burm.* than of this species.

A native of the forests of Midnapore in Bengal; flowers during the rains. Seed ripe in November, December, and January.

Stem stout, in old plants as thick as a man's arm, covered with spongy, cracked, dull ash-coloured bark. *Branches* and *branchlets* twining up and over large trees, to a great extent; tender shoots somewhat hairy. *Leaves* long-petioled, round, and round-cordate, entire, bristle-pointed, though obtuse, or even emarginate; somewhat villous, particularly underneath, and there, while young, hoary; *length* from three to six inches; *breadth* nearly the same. *Pe-*
I. *tioles* of various length, round, villous, with a dark-coloured gland on each side of the apex.
495 *Peduncles* axillary, solitary, generally shorter than the petioles, three-flowered, though frequently one of the three, or even two of them, are abortive. *Flowers* short-pedicelled, large, pure white, expanding at sun-set, and perfuming the air to a considerable distance with a fragrance resembling that of the finest cloves. In fact it is the Prince of *Convolvulaceæ. Bractes* sub-lanceolate, three to each of the lateral flowers. *Calycine leaflets* ovate-cordate, obtuse, a little hairy. *Corol; tube* cylindric; *border* ample and nearly entire. *Filaments* woolly at the base. *Germ* surrounded with a yellow nectarial ring, ovate, four-celled, with one *ovulum* in each cell, attached to its lower, inner, angle. *Stigma* composed of two distinct, cylindric, glandular lobes. *Berry* dry, smooth, shining brown, ovate-oblong in our cultivated plants; somewhat pointed, size of a filbert, one-celled. *Seeds* from one to four; in our gardens one is by far the most common number; enveloped in a soft, white, spongy substance, which in drying separates from the inside of the pericarpium and adheres to the seed, which is of an oval shape, and about the size of a small pea. *Integuments* two, besides the exterior spongy lamina; the *exterior* one hard and tough; the *interior* one membranaceous, and entering the folds of the *cotyledons. Embryo* as in the other *convolvulaceæ.*

Obs. The trivial name *bona-nox* is well applied here on account of the charming appearance, and delightful fragrance of its flowers from the time they first expand, about sun-set, until sun-rise, when they wither. But I doubt if it is the species to which Linnæus gave this name; I rather think it was that which I now call Ipomoea *grandiflora (Munda valli of Van Rheede.)*

11. L. *uniflora. R.*

Perennial, twining, hoary. *Leaves* reniform-cordate, acute. *Peduncles* one-flowered. *Berry* dry, spherical.

Ipomoea candicans. *Rottler. Mss.*

I. *Teling.* Boordi-tiga.

496 This species is very common in forests over the southern parts of the Carnatic, and Tanjore country. Flowering time the cold season.

Stem twining, woody, running over high trees, &c. *Young shoots* hoary. *Leaves* petioled, broad-cordate, or reniform, entire, with the under side downy, particularly while young; from one to two inches each way. *Petioles* the length of the leaves, having two glands laterally at the extremity. *Peduncles* axillary, solitary, length of the petioles, one-flowered. *Flowers* large, pure white, opening at sun-set, and drooping at sun-rise. *Bractes* two, near the top of the peduncles. *Tube* long, slender, cylindric. *Nectary* a yellow, fleshy ring surrounding the base of the germ. *Stigma* two-lobed. *Lobes* linear-oblong, erect. *Berry* spherical, dry, smooth, shining, brown, one-celled. *Seeds;* from one to four is the natural number, immersed in a brownish farinaceous pulp.

12. I. *ornata. R.* Page Carey Ed.

Shrubby, erect, ultimately twining. *Leaves* nearly round, entire, with large round lobes, sericeous underneath. *Peduncles* many-flowered. *Stigma* with two lanceolate lobes. *Berry* dry, oblong, beaked, shorter than the calyx.

A native of the interior parts of India; from Cawnpore Colonel Hardwicke sent the plants to the Botanic garden at Calcutta, where they blossom during the rains.

Stems sub-herbaceous, flaccid, scarcely ever twining, sometimes sericeous. *Branches* few, and like the stems. *Leaves* nearly round, posterior lobes rounded; margins entire; apex rather emarginate; smooth above, of a dull livid colour underneath, and somewhat sericeous; general size from three to six inches each way. *Petioles* round, sericeous, shorter than the leaves, with a greenish gland on each side near the apex as in all the other species of this family. *Peduncles* axillary, as long as the petioles, and like them bearing from about six to twelve, very large, pure white flowers, nearly resembling those of Ipomoea *grandiflora* and *Lettsomia bona-nox*. *Bractes* lanceolate. *Calyx, leaflets* linear-oblong. *Corol* with a cylindric tube, from two to three inches long, border about four inches in diameter. *Flowers* hairy at the base. *Anthers* within. *Germ* four-celled, four-seeded. *Stigma* of two linear-oblong lobes. *Berry* oblong, shorter than the calyx, smooth, pointed, one-celled. *Seeds* from one to four, (one is most common,) enveloped in a little mealy pulp. *Perisperm* and *embryo* as in the order. I. 497

IPOMOEA.

Calyx five-leaved, (or five parted). *Corol* funnel-shaped. *Stigma* two-lobed. *Capsules* two-celled; *cells* two-seeded.

1. I. *grandiflora. R.*

Perennial, twining, sometimes murexed. *Leaves* cordate, rarely lobate, acute, smooth. *Peduncles* length of the petioles, three-flowered. *Stigma* of two round lobes. *Capsules* two-celled.

Munda-Valli. *Rheed. Mal.* xi. 103. *t.* 50.

Convolvulus grandiflorus. Linn. suppl. plant. 136.

Munda-valli. *Asiat. Res.* iv. 257.

Beng. Doodiya-Kulmi.

Ipomoea *bona-nox. Jacq. Hort. Schoenb.*

Convolvulus maximus. *Sloan. Jam.* 96. *f.* 1. is most likely this plant, for I have reared it in Bengal from seed received from the West Indies with that name. The only difference is that the leaves of the West Indian plant are rather more angular, and like Sloane's figure, than those of the East Indian one.

A large, twining species, common in hedges near Samulcota, and in Bengal, and on the banks of water courses amongst bushes. Flowers during the cold season in the Circars, and in Bengal during the hot and rainy seasons.

Stem twining, running to the height of from ten to twenty feet, smooth, except that it is sometimes armed with small inoffensive prickles. *Leaves* scattered, petioled, cordate, pointed, generally entire, though sometimes a little lobed, or angular, smooth, about three or four inches long and three broad. *Petioles* round, smooth, length of the leaves. *Peduncles* axillary, smooth, clubbed, length of the petioles or more, from two to four-flowered. *Flowers* remarkably large, the border being from four to six inches in diameter, pure white, delightfully but faintly fragrant, opening at sun-set, and drooping at day-light. *Tube* very long, cylindric. *Stigma* double. *Capsules* ovate, smooth, two-celled, four-valved. *Seeds* four, viz. two in each cell, smooth, black. I. 498

Obs. Till I observed Gærtner's figures of the capsule and seeds of *Ipomoea bona-nox* I considered this to be that plant. Dr. König also thought it was *bona-nox* and I think he said Linnæus the son had committed a mistake when (in the *Supplementum Plantarum*) he called this plant *Convolvulus grandiflorus*, instead of *Ipomoea grandiflora*.

2. I. *salicifolia. R.*

Leaves linear-lanceolate, acuminate. *Peduncles* one to three-flowered, length of the petioles.

Found by Dr. Buchanan in the district of Rungpore in Bengal. In the Botanic garden at Calcutta it is biennial, flowering in the rainy season.

Stem and *branches* twining to a moderate extent, round, and smooth. *Leaves* short-petioled, linear-lanceolate, tapering from the rounded base into a long, slender, acute point, entire, smooth on both sides, from three to eight inches long, and scarcely one broad at the broadest part. *Peduncles* axillary, solitary, half an inch long, bearing one, two, or three large, pure white flowers. *Calyx; leaflets* five, ovate, smooth. *Corol* with a cylindric tube of about an inch and a half in length, border flat, obscurely divided. *Stamina* hid in the tube of the corol. *Stigma* of two round lobes. *Capsules* two-celled, with three seeds in each.

3. I. *muricata. R.* I. 499

Annual, twining, muricate. *Leaves* cordate. *Peduncles* few-flowered; inside of the tube of the corols hairy.

Convolvulus *muricatus. Linn. Mant.* 44.

I have only met with this in my own garden; it was raised from seeds sent from Persia and proves annual.

Stem as in I. *grandiflora*, but much more murexed, and not so long, the leaves also the same, but much larger. *Peduncles* axillary, half the length of the petioles, from two to six-

Page Carey Ed. flowered. *Flowers* large, pale bluish purple. *Tube* widening a little towards the mouth; inside hairy, by which mark it is instantly distinguished from I. *grandiflora*.

4. I. *multiflora*. *R.*

Stems woody, twining. *Leaves* broad-cordate, downy. *Peduncles* as long as the leaves, umbelliferous.

A common species, native of hedges, forests, &c. Flowering time the cold season.

Stem perennial, woody, twining up, and over trees and bushes. *Leaves* scattered, petioled, broad-cordate, entire, a little bent downwards, bristle-like pointed, both sides a little downy, particularly the under one, from three to four inches each way. *Petioles* round, downy, from two to three inches long. *Umbels* three or five-parted, many-flowered. *Peduncles* round, nearly erect, longer than the leaves. *Flowers* numerous, very large, rose-coloured; inside of the tube a bright red. *Leaflets* of the calyx unequal. *Stigma* two-lobed; *lobes* globular.

Obs. This species while in flower is one of the greatest beauties of our forests. Whether this is what König called *Ipomœa Burmanni* or not I cannot say.

5. I. *sepiaria*. *Kön. Mss.*

Perennial, twining, hairy. *Leaves* cordate. *Peduncles* many-flowered, and with the pedicels clavate; *capsule* four-celled.

I. 500 Pira-tali. *Rheed. Mal.* xi. *p.* 109. *t.* 53. is certainly this plant, though quoted for *Convolvulus sepiarius*. Can they be the same? Probably they are, as Vahl's description agrees tolerably well with my plant.

Teling. Metta-tootia.

This is one of the most common species on the coast, it grows plentifully in every hedge, thicket, &c. Flowers during the rainy and cold season.

Stem twining, perennial; *young shoots* round, filiform, hairy. *Leaves* alternate, petioled, cordate, pointed, somewhat sagittate, or angular behind, otherwise entire; smooth, often clouded with brownish spots in the centre; from two to three inches long. *Peduncles* axillary, as long as the leaves, round, smooth, umbelled, many-flowered. *Flowers* large, of a beautiful pale rose-colour. *Stigma* two-lobed; *lobes* globular. *Capsule* smooth.

6. I. *cærulescens*. *R.*

Perennial, twining, all the tender parts hairy. *Leaves* round, cordate, acute. *Peduncles* erect, length of the petioles, from one to three-flowered. *Stigma* of three round lobes. *Capsules* smooth, three-celled.

Native place uncertain, nor can any Asiatic names be procured for this beautiful, distinct species.

Stems perennial, twining to a great extent; *young shoots* round, hairy, and twining; hair reflexed. *Leaves* round-cordate, long-petioled, posterior lobes large and rounded, apex acute, surface less hairy than the petioles and shoots, size three or four inches each way. *Peduncles* axillary, length of the petioles, hairy, at all times erect, from one to three-flowered. *Flowers* pretty large; their colour when they first expand early in the morning, is a beautiful lively pale blue, or azure, gradually growing darker. *Bractes* lanceolate, hairy. *Calyx* five-cleft; *segments* cordiform, hairy, about half the length of the tube of the corol; *tube* whitening

I. 501 a little from the base, paler than the undivided border. *Germ* three-celled. *Stigma* three-lobed; *lobes* round. *Capsules* smooth, three-celled, with two smooth, black seeds in each.

Obs. This, and I. *cærulea* (probably I. *hederacea* of Jacquin.) are exactly the same in the *inflorescence, germ, stigma* and *capsules*; but they differ specifically. This being perennial, and having the leaves constantly without any tendency to be lobate, whereas that is annual, with three-lobed leaves. I may farther add, that plants raised from seed received from the Honourable Charles Greville, in London, under the name *Convolvulus hederaceus*, differ only in the colour of the flowers from my I. *cærulea*, in which it is blue, and in this, *hederacea*, white.

7. I. *cærulea*. *Kön. Mss.*

Annual, twining, hairy. *Leaves* cordate, three-lobed, downy. *Peduncles* from two to three-flowered, margins of the corol sub-entire. *Stigmas* three-lobed. *Capsules* three-celled.

Beng. Neel-kulmi.

It is common during the rains in most parts of India.

Stems and *branches* twining, annual, round, hairy, from six to twelve feet long, as thick as a crow's quill. *Leaves* alternate, petioled, broad-cordate, three-lobed, downy; from two to four inches long, acute, &c. almost as in *Dillenius's figures* of *Convolvulus Nil*. *Peduncles* axillary, length of the petioles, round, hairy, from two to three-flowered. *Bractes* and *segments* of the calyx linear. *Flowers* large, of a beautiful light, but bright blue. *Stigma* sub-globular, large, glandular, three-lobed. *Capsule* ovate, shorter than the calyx, smooth, three-celled, with two seeds in each.

I have often reared this species in my garden, on account of the great beauty of its large flowers, and do not find it to vary.

The seeds of this plant are sold in the native apothecaries' shops in Calcutta, under the

I. 502 name *Kala dana*, and used as a purgative. I have heard them much praised as an effectual, quick-operating, safe cathartic. The dose is from thirty to forty grains of the seeds in substance, when administered they are gently roasted like coffee, then powdered, and given in any convenient vehicle.

It scarcely differs sufficiently from *Convolvulus Nil* to warrant its being considered more than a variety of that, or that of this. In that the leaves of plants growing in the same situation are less divided and the lobes sharper and less pointed. The seeds of the corol pentangled, and the angles pointed as in Dillenius's figure, whereas in *Convolvulus Nil* they are nearly circular.

8. I. *phœnicea. R.* Page Carey Ed.

Annual, twining. *Leaves* broad-cordate; *posterior* edges often variously lobate. *Racemes* dichotomous, many-flowered. *Leaflets* of the calyx end subulately. *Stamina* erect. *Stigma* globular.

A native of the southern parts of the Coromandel coast, the seeds were received into this garden from Dr. Berry, who procured them from Dindigul. In Bengal it thrives luxuriantly, and is in blossom most part of the year, but chiefly during the cool season. This plant has also been reared from seeds received from the island of Trinidad; there is therefore the more reason to compare it with I. *coccinea.*

Stem and *branches* twining, young parts somewhat angular, and twisted. *Leaves* alternate, petioled, cordate, acuminate, sometimes three-lobed; sides and posterior edges variously dentate, sinuate, or lobate; smooth on both sides, from two to six inches each way. *Petioles* nearly as long as the leaves, channelled. *Racemes* axillary, solitary, generally two-cleft, much longer than the leaves. *Flowers* remote, large, of a most beautiful bright crimson colour. *Calyx* smooth, the leaflets subulate at the end. *Corol; tube* nearly two inches long, contracting towards the base, slightly curved; *border* at first expanded, afterwards a little revolute. *Stamina* projecting considerably beyond the mouth of the tube of the corol. *Stigma* subglobular. *Capsules* smooth, four-celled, with a single seed in each. I.

Obs. This is by far the most gaudy plant of the kind I have yet met with; no painter can do justice to the brightness of its flowers. 503

9. I. *Pes-tigridis. Willd. spec.* i. 886.

Annual, diffuse, or twining, hairy. *Leaves* palmate. *Peduncles* longer than the petioles. *Flowers* several in a solitary, aggregate, involucred head.

Beng. Languli-luta.

Pulli-schovadi. *Rheed. Mal.* xi. 121. *t.* 59.

Volubilis zeylanica. *Dill. Elth. tab.* 318. *f.* 411.

This is one of the most common, and generally diffused plants we have in India. Flowering time the rainy season chiefly.

Stems diffuse, or twining when supported, round, and very hairy; hairs fulvous, and diverging. *Leaves* alternate, long-petioled, palmate, hairy; lobes from five to nine, lanceolate, entire. *Peduncles* long, or longer than the petioles, hairy, each supporting a single head of sessile, white, or pink flowers; the latter variety is smaller than the white one. *Involucre* from eight to twelve-leaved; *leaflets* unequal, recurved, lanceolate, obtuse, hairy. *Calyx* of five lanceolate, acute, unequal, leaflets. *Corol*, with its five lobes deeply emarginate. *Stigma* of two round lobes. *Capsules* two-celled. *Seeds* two in each cell.

10. I. *Quamoclit. Willd. spec.* i. 879.

Annual, twining. *Leaves* pinnate, leaflets filiform. *Peduncles* one or two-flowered.

Tsjuria-cranti. *Rheed. Mal.* xi. 123. *t.* 60.

Flos cardinalis. *Rumph. Amb.* v. 155. *t.* 2.

Camalata. *Asiat. Res.* iv. 256.

Sans. Kamaluta, Turooluta.

Beng. Lal kamluta or lal turoolata, the red variety; sweta kamluta or sweta turooluta, the white-flowered variety. I.

A native of various parts of India. Flowers during the rainy season in Bengal. 504

11. I. *pileata. R.*

Perennial, twining. *Leaves* profoundly round-cordate, villous. *Flowers* a few, sessile in a peltate, four-cornered, peduncled, axillary *bonnet.*

This rather small, villous species has been introduced from China into the Botanic garden at Calcutta, where it blossoms and ripens its seeds during the cool dry months from November to February. It is particularly remarkable on account of its entire, rhombiform concave *bonnet* or *involucre*, in the bottom or centre of which, from three to six middle sized, rosy, funnel-shaped flowers sit; it is hairy round the flowers, as are also the unequal leaflets of the calyx.

CAMPANULA. Schreb. gen. N. 290.

Calyx five-parted. *Corol* campanulate. *Filaments* with their lobes dilated, and arched. *Stigma* from three to five-cleft. *Capsule* inferior, from three to five-celled, opening by pores on the sides.

1. C. *dehiscens. R.*

Annual, ascending, round, a little hairy. *Leaves*, sessile, linear-lanceolate, remotely toothed. *Flowers* from five to six, terminal. *Capsules* without lateral pores and opening at the apex.

A native of Bengal. Flowering time the cold, and beginning of the hot season.

Root nearly simple, white, annual. *Stems* and *branches* ascending, about a foot high, round, hairy. *Leaves* alternate, sessile, linear-lanceolate, remotely, and lightly toothed; from one to two inches long. *Flowers* terminal, corymbiform, white, pretty large, bell-shaped. *Calyx*, I.
corol, *stamens* and *pistil* as the genus. *Capsule* obovate, without lateral pores, opening at 505
the apex. *Seeds* numerous, minute. *Receptacle* reniform, in the angle of each cell.

2. C. *lancifolia. R.*

Ramous, smooth. *Leaves* sub-opposite and alternate, short-petioled, lanceolate, serrate, acuminate. *Flowers* terminal. *Calycine leaflets* lanceolate and laciniate. *Capsules* obovate, five-celled.

A native of the moist vallies of Chittagong, where it flowers in October.

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PHYTEUMA. Schreb. gen. N. 292.

Calyx semi-superus, five-parted. *Corol* rotate, inserted on the calyx. *Germ* inferior three-celled, ovula numerous, on a pendulous receptacle from the top of each cell. *Stigma* three-lobed. *Capsule* three-celled. *Seeds* numerous.

1. P. *begonifolium. Roxb. Hort. Beng.* 85.

Creeping, woolly. *Leaves* alternate, semicordate, serrate. *Racemes* axillary, secund, recurvate. *Bractes* cuneate.

A native of Pulo Pinang, where Mr. W. Roxburgh found it in forests shaded by trees and shrubs, and with flowers and ripe seeds in June and July.

Stems somewhat dichotomous, round, fleshy, spreading on the ground, and rooting at the insertion of the leaves, the younger parts as well as the petioles and racemes clothed with a harsh, ferruginous, woolly pubescence. *Leaves* alternate, petioled, semicordate, (as in some species of *Begonia*), serrate, acute, pretty smooth; length six or eight inches, breadth about half the length. *Petioles* from one to two inches long. *Stipules* none. *Racemes* axillary, solitary, secund, revolute, twice the length of the petioles. *Flowers* short-
I. pedicelled, alternately arranged in two rows on the anterior side of the raceme; while two
506 rows of alternate, cuneate, woolly bractes occupy the posterior side. *Calyx* one-lobed; *tube* gibbous, and growing to the lower half of the germ. *Border* of five sub-orbicular, woolly, permanent segments. *Corol* one-petalled, rotate, tube very short, and united with the calyx into one envelope which closely embraces the upper part of the germ; border of five, oblong segments, alternate with those of the calyx, and double their length, withering. *Filaments* five, short, inserted partly on the tube and top of the germ. *Anthers* oblong. *Germ* inferior, oblong, three-celled, each cell containing numerous ovula attached to a long, free, linear receptacle, which is united, by a slender pedicel, to the top of the cell. *Style* very short and thick. *Stigma* concave, with a thick fleshy three-lobed margin. *Capsule* oblong, clothed with the woolly tube of the calyx, and crowned with the segments of its border, as well as the withered corol, three-celled, (in what manner they open I have not been able to ascertain.) *Seeds* very numerous, adhering to the long, filiform, free receptacles, which are attached to the apex of the capsules as already mentioned.

LOBELIA. Schreb. gen. N. 1363.

Calyx five-cleft. *Corol* one-petalled, irregular. *Anthers* united. *Capsule* inferior, two or three-celled.

1. L. *nicotianifolia. Heyne's Mss.*

Erect. *Leaves* sub-sessile, lanceolar, acute, entire. *Raceme* terminal.

A stout, tall species, first described by Mr. Heyne, who found it indigenous in the vicinity of Bangalore.

2. L. *trigona. R.*

Annual, base creeping, erect parts three-sided. *Leaves* sessile, cordate, serrate. *Pedunculs* axillary, longer than the leaves, one-flowered.

A small, annual, ramous plant which delights in wet pasture ground, and appears during
I. the wet and cold seasons.
507 *Stems* near the root creeping, above erect, ramous, three-sided, smooth, the whole plant is from six to twelve inches high. *Leaves* sub-sessile, cordate, grossly serrate, smooth. *Peduncles* axillary, solitary, erect, length of the leaves or longer, two-bracted at the base. *Flowers* small, blue. *Corol* inserted in the mouth of the calyx.

3. L. *radicans. Willd. spec.* i. 948.

Annual, creeping, smooth. *Leaves* sessile, lanceolate, remotely serrulate. *Peduncles* axillary, solitary, twice the length of the leaves, one-flowered.

Accidentally introduced from China, into the Botanic garden at Calcutta, where it blossoms freely during the rains. Our plants are but small, very ramous, spreading over the soil, and striking root at every branchlet. The flowers are large for the size of the plant, pink-coloured; segments of the corolla equal, unilateral, and narrow-lanceolate, with two green glands under the two middle sinuses, opposite to the long, green, two-lobed stigma.

SPHENOCLEA. Gœrt. carp. i. 113. *tab.* 24.

Calyx five-parted. *Corol* one-petalled. *Capsule* inferior, two-celled. *Seeds* numerous.

1. S. *zeylanica. Willd. spec.* i. 927.

Pongati. *Rheed. Mal.* ii. 47. *t.* 24.

Sphenoclea *Pongatium. Lamarck.*

Gærtnera *Pangati. Retz. Obs.* vi. *p.* 24.

Beng. Jeel-mureech.

Teling. Neeroo-pipli.

An erect annual; a native of watery places. Flowers during the wet season.

I. *Root* fibrous, annual. *Stem* erect, round, ramous, smooth, glossy, piped. *Branches* alter-
508 nate, ascending. *Leaves* alternate, short-petioled, lanceolar, entire, tender, smooth, from two to three inches long, and half an inch broad. *Stipules* none. *Spikes* terminal, or leaf-opposed, peduncled, cylindric, middle-sized, closely surrounded with the fructifications. *Bractes* small, three-fold, one-flowered; one below, and one on each side, pressing the calyx. *Flowers* small, white. *Calyx* superior, one-leaved, five-cleft; *divisions* obtuse, spreading when the flower is open, afterwards converging over the capsule, permanent. *Corol* one-petalled. *Tube* short;

throat gibbous; *mouth* five-cleft, inflexed. *Filaments* five, short, inserted into the mouth of the tube. *Anthers* two-lobed, in the gibbous throat of the corol. *Germ* inferior, angular. *Style* short. *Stigma* headed. *Capsule* turbinate, angular, (from being pressed one against another,) two-celled, circumcised. *Seeds* minute, very numerous, oblong. Page Carey Ed.

NAUCLEA. Schreb. gen. N. 295.

Flowers aggregate, on a globular receptacle. *Corollets* funnel-shaped. *Germs* inferior, two-celled; *cells* many-seeded; *attachment* interior. *Capsules* two-celled. *Seeds* many, imbricated, and winged. *Embryo* inverse, and furnished with a perisperm.

1. N. *undulata. R.*

Arboreous, branches brachiate. *Leaves* petioled, ovate-oblong, waved. *Stipules* elliptic, length of the petioles. *Flowers* terminal, solitary. *Capsules* united.

A native of the Moluccas, from thence introduced into the Botanic garden at Calcutta in 1789, where the trees blossom in May and June; the seeds take above a year to ripen.

Trunk perfectly straight to the top of the tree. *Branches* brachiate. *Bark* smooth, that of the ligneous parts brown, that of the tender parts green. Height of ten year old trees, from fifteen to twenty-five feet. *Leaves* opposite, petioled, ovate-oblong and oblong, waved, entire, polished on both sides; from six to twelve inches long by from three to six broad. *Petioles* coloured, slightly channelled, about two inches long. *Stipules* elliptic, length of the petioles, smooth. *Peduncles* terminal, solitary, drooping, each bearing a single, large globular, aggregate head of numerous, small, most beautiful, yellow, fragrant florets. *Bracte*, a small, withering, somewhat four-toothed ring near the base of the peduncles, and hid by the stipules. *Calyx, common* none, or very obscure; *proper*, of one fleshy cup, cut into four or five, clavate segments. *Corol* funnel-shaped, much longer than the perianth; yellow and fragrant; *divisions* of the border four, or five, oval, obtuse. *Filaments* scarcely any. *Anthers* on the five fissures of the border of the corol. *Germs* inferior, grown together, two-celled, with many *ovula* in each, attached to their proper receptacles, projecting downwards from their attachment to the partition a little above its middle. *Style* much longer than the corol. *Stigma* large, oblong, with the apex somewhat two-lobed. *Fruit* the size of a small apple, rough with the remains of the segments of the calyx, now forming five conic knobs on the crown of each of the partial seed vessels, which are all firmly grown together, each of these are two-celled. *Seeds* rarely more than one in each cell, and fragrant, not one of the whole being abortive, they are oblong, not winged but crowded with a fleshy gland which unites them to the receptacles on the partition. *Integuments* uncertain, from the smallness of seed. *Perisperm* conform to the seed. *Embryo* inverse, nearly as long as the perisperm. *Cotyledons* oblong. *Radicle* oval, superior. I. 509

2. N. *cordata. R.*

Leaves petioled, broad-ovate-cordate, obtuse, coriaceous, smooth. *Stipules* obovate. *Flowers* terminal, solitary. *Capsules* united.

A native of Ceylon, reared from seed sent from thence in 1802, to the Botanic garden at Calcutta by General Hay Macdowall, where the young trees blossomed in May and June, 1808, and the seeds ripened in the cold season.

Trunk straight up through the branches to the very top of the tree. *Bark* of a light greenish ash-colour. *Branches* spreading, horizontal, forming a broad-ovate, shady head, general height of our six year old trees from fifteen to twenty feet. *Leaves* opposite, short-petioled; from round-cordate to ovate-cordate, obtuse, entire, coriaceous, smooth; marked with prominent, alternate veins; the upper surface shining dark green, the under one paler; length from three to nine inches, and from two to eight broad. *Petioles* roundish, smooth, about an inch or an inch and a half long. *Stipules* interfoliaceous, large, roundish, or obovate, apex rounded, marked with numerous, fine veins, caducous. *Peduncles* terminal, solitary, and generally in the small lateral branchlets, drooping, each supporting a large, beautiful, globular, aggregate head of very fragrant bright yellow florets. *Bracte* a small, irregularly four-toothed, withering ring round the peduncles, near the base, within the stipules. *Calyx, common* none, or very obscure; *proper* deeply cut into four or five, fleshy, clavate, permanent segments, which thicken as the fruit advances in size. *Florets* funnel-shaped, four or five-parted. *Divisions* obovate, obtuse. *Filaments* very short, from the mouth of the tube just under the fissures of its border. *Anthers* cordate. *Germ* inferior, completely united to each other, their whole length two-celled, each containing many imbricated seeds attached to a receptacle rising from the partition a little above its middle. *Style* much longer than the corol. *Stigma* oblong, apex obscurely two-lobed, of a beautiful pearl colour. *Fruit* aggregate, size of a small apple, round, rough, with the obtuse, fleshy permanent portions of the divisions of the calyces; the partial seed vessels thereof are firmly united, angular, inversely conical, two-celled, with a few oblong, imbricated seeds in each, besides a number of small, brown scales, which are the abortive ovula, as may be seen by the structure of the germ as well as by their being attached to the same central receptacle; the full grown seeds are crowned with a greenish, fleshy gland, to which the umbilical cord is fixed. *Albumen* conform to the seed. *Embryo* inverse, straight. *Cotyledons* oval. *Plumula* minute. *Radicle* cylindric, superior. I. 510 I. 511

3. N. *macrophylla. R.*

Leaves stem-clasping, narrow-oval, obtuse, villous underneath. *Stipules* lanceolate. *Peduncles* terminal, solitary, one-flowered.

From Amboyna this magnificent tree was introduced into the Botanic garden at Cal-

Page Carey Ed. cutta, in 1797. In 1814, they began to blossom in June: the trees were then fifty feet high, and the trunk of the largest not two inches three feet from the ground, while young their growth was not rapid.

Trunk perfectly straight, like the mast, to the very top of the tree. *Bark* smooth, dark brown. *Branches* decussate. *Branchlets* round and smooth. *Leaves* opposite, stem-clasping, broad oblong, entire, obtuse, and though they completely enclose the branchlets, yet taper more towards the small waved base than the apex, somewhat villous particularly underneath, veins parallel; length from eight to twenty-four inches, and equal in proportion, when the trees were young, they were entire; their tail-like base *Stipules* opposite, broad-lanceolate, concave, smooth and veinless, about three inches long. *Peduncles* terminal, solitary, length of the stipules, bracteate, giving support to a single sweet-scented *Head* of fifty-three inches in diameter, and sweet-smelling, the corollets are very numerous, of a pale yellow colour, and the stigmas, which project far beyond them, are pure white. *Calyx* scarcely visible, proper *Corolla* of five, long, clavate *Lobes*. *Tube* funnel-shaped. *Teeth* short, oblong, pointed, erect, the mouth; segments five, valve-like, spreading. *Filaments* none. *Anthers* inclosed in the mouth of the tube of the corol, under the fissures of its border, sagittate. *Germ* numerous, distinct, inferior, somewhat wedge-shaped. *Pericarpium* fleshy, pentagonal, five-celled, with numerous, each, attached at every part of a five-lobed receptacle, which is united to the partitions, a little above its middle, and descends deep into each cell in fact, it is exactly that of Gaertner's *Uncaria* (*Uncaria pentandra*, t. 147. f. 3.) inverted. *Style* twice the length of the corol. *Stigma* clavate, somewhat two-lobed.

I. 512

4. N. *Cadamba*. *R.*

Leaves petiolate, ovate. *Stipules* triangular. *Peduncles* terminal, solitary; *divisions* of the calyx *linear*. *Capsules* four-celled at top and two-celled at the base. *Seeds* without a wing.

Sans. Neepa, Priyuka, and Cadamba.

Beng. Kudum.

Katou-tsjaka. *Rheed. Mal.* 3. *t.* 33.

It commonly about Calcutta, where it grows to be a large tree, and is not only highly ornamental, but very useful from the extensive close shade it yields. Flowering late the hot season. Seed ripe in October and November.

Trunk erect, and perfectly straight, bark smooth, dark grey. *Branches* numerous, horizontal. *Leaves* cuneate, between lanceolate and lanceolate spreading, petioled, waved, smooth entire, nerves hairy, and simple; from five to ten inches long. *Petioles* smooth, about an inch and a half long. *Stipules* half-lanceolate, triangular. *Flowers* solitary, terminal, large, pale yellow, corollets numerous, forming a large, perfect globular, beautiful, sweet-smelled head with the large white clubbed stigmas projecting. *Calyx* common, very small, five-parted. *Corolla* as in the genus, only the divisions are more pointed. *Capsules* inferior, four-lobed, tapering from the apex to the base, near the top it is composed of two, distinct, small cells, below the common envelope; the lower two-thirds is two-celled only. *Seeds* numerous, very small, angular, brown colour.

I. 513

5. N. *glabra*. *R.*

Leaves lanceolate and smooth. *Stipules* linear. *Peduncles* terminal, three. *Divisions* of the calyx triangular. *Stigma* globose; *Seeds* three or four in each cell.

A native of the Moluccas.

6. N. *parviflora*. *Willd. spec.* i. 929. *Roxb. Corom.* i. 40. *tab.* 52.

Branches and *branchlets* brachiate. *Leaves* ovate. *Stipules* oval. *Flowers* terminal, one or three. *Seeds* imbricated, membrane-winged.

Teling. Bota kadumee.

This grows to be a large tree; is a native of almost every part of the coast of Coromandel, but chiefly up amongst the mountains. Flowers during the cold season.

Trunk straight. *Bark* brownish grey, and cracked. *Branches* opposite, numerous, spreading, forming a large oval, shady head. *Leaves* opposite, decussate, petioled, ovate, entire, smooth. *Petioles* channelled. *Stipules* large, oblong, obtuse, glutinous, caducous. *Peduncles* terminal, single or three, when three the middle one is shortest; each one bracted, each supporting a single, globular, naked head of corollets. *Bractes* two, opposite, near the extremity of the peduncle, oval, caducous. *Corollets* small, light yellow. *Calyx common* none. *Common receptacle* chaffy, wedge-form, hairy at their insertions. *Proper* pentarch very minute, entire. *Corolla* funnel-shaped. *Tube* slender. *Border* five-parted; *divisions* pointed, spreading. *Filaments* five, short, inserted just within the mouth of the tube. *Anthers* erect, oblong, pointed above. *Germ* beneath. *Style* thread-form nearly twice the length of the corol. *Stigma* large, resting on the style (like the cap of liberty, turbinate, covered with a scabrous crust or bark, which splits irregularly when the seeds are ripe; within are the proper *Pericarpium* capsules, each containing a one-celled, opening from the apex and down on the inside. *Seeds* several, very minute, oblong, tailed, inversely imbricated round the outside of their receptacle, with insertions downwards.

I. 514

Obs. The wood is of a light chocolate colour, fine and close grained, is used for various purposes where it can be kept dry, but exposed to wet it soon rots.

7. N. *cordifolia*. *Willd. spec.* i. 929. *Roxb. Corom.* i. 40. *tab.* 53.

Leaves opposite, round-cordate, downy underneath. *Flowers* axillary, from one to three. *Segments* of the calyx clavate; *seeds* membrane-winged, not imbricated.

Beng. Keli-kudum.

Teling. Daduga.

This like the foregoing species, grows to be a very large tree; it is a native of the moun-

[illegible] Cavan. Icon.

[illegible] I. 713

[illegible]

[illegible] I. 716

[illegible]

[illegible] I. 717

[illegible]

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Leaves ovate-lanceolate. *Peduncles* axillary, solitary. *Capsules* clavate, pubescent.

Funis uncatus angustifolius. *Roxob. Amb.* 3. p. 63. t. 34. f. 2 and 3.

A shrub, scandent slowly, a native of Pulo Pinang, Sumatra, Malacca, &c.

Leaves opposite, short petioled, from petiolate-lanceolate, entire, acute, smooth on both sides, about four inches long and two broad. *Stipules* oblong, pairing the upper margin of the base of the petioles, caducous. *Heads* axillary, solitary, or in opposite pairs, simple, recurved, hooked. *Peduncles* axillary, solitary, about the middle jointed and bracted, supporting a single globular head, of beautiful, green and pink, small aggregate corollas. *Bracteas*, about the middle of the peduncle, a three or four-cleft tubular perianth-like cup. *Perianth* (common) one valve three cleft, tubular, proper segments on the outside
1 with a five-cleft border. *Corollets*: *tube* filiform; *border* of five obtuse divisions, villous on
518 the outside, and hairy in the centre of the inside. *Filaments* short. *Anthers* large, on the mouth of the tube, three bifurcate, subulate, subexserted. *Style* as long as the tube of the corol. *Stigma* clavate. *Capsules* pubescent, clavate, longitudinally grooved, crowned with the five-cleft permanent calyx, two-celled, two-valved. *Seeds* numerous, imbricated, winged.

The Gambier is the Malay name of an extract, prepared from the leaves of this plant. And I believe one of the drugs of not the only one, formerly called Terra Japonica in Europe. For the following account thereof I am indebted to Dr. Charles Campbell, of Bencoolen, who says:

"This material is called by the Malays Gambier. It is chewed by the natives mingled with *Betel* leaf and areca after the manner in which the Cutch is used on the continent of India.

"With some sweetness it has a more highly concentrated astringent principle than Terra Japonica. I am sometimes that a trial should also be made of its power in tanning.

"In regard to the natural history of the Gambier it is procured from a climber Pulo known to the Botanic garden.

"It is the *Ficus uncinata*, or Pisang (Pulo) Gambier of Rumphius. *Herb. Amboin.* vol. v. tab. 34. The variety from which it is chiefly made is that denominated by Rumphius the *Ficus uncatus angustifolius*.

"The preparation is simple, the young shoot and leaves are sliced and boiled in water for some hours, until a fecula is deposited; this, impressed in the sun to the consistence of a paste, is thrown into moulds of a circular form, and in this state the Gambier is brought to market.

"Rumphius has fallen into an error in asserting that Gambier is not made from this plant, for in my journey to Cochin China I had an opportunity of inspecting the whole process having resided some days at a small village near the foot of the mountain, where the Sultan of Siam has established a colony for the purpose of carrying on the manufacture to a
1 considerable extent.
519 "The price at which it can be procured from the Northern parts on this coast, I have ascertained to be nearly ten dollars per hundred weight. It can be supplied in any quantity desired, for the plant abounds in these districts, and the mode of making the astringent matter is such as requires neither much attention nor labour."

So far Dr. Campbell. But in other parts to the eastward of the Bay of Bengal I learn that the process is carried on by boiling the leaves and young shoots, evaporating the decoction by fire and the heat of the sun. When sufficiently inspissated it is spread out thin and cut into little square cakes and dried.

The same substance is mentioned by *Marsden* in his *History of Sumatra*, at p. 242-3, who refers for a particular detail of the cultivation of the plant and manufacture of the Gambier, to the 2d volume of the *Transactions of the Batavian Society*.

2. *U. pulchella*. *R.*

Leaves ovate, entire, smooth. *Peduncles* axillary and terminal, compound. *Capsules* and *common receptacle* villous.

A native of the Island of Pulo Pinang.

Trunk and *branches* woody, climbing to a great extent. *Bark* dark-brown. *Leaves* opposite, petioled and obovate, pointed, smooth on both sides, entire; from three to six inches long. *Petioles* short, recurved, channelled. *Peduncles* axillary and terminal, expanding, bearing four and to three aggregate flowers. *Pedicels* nearly as long as the peduncles, bracted and jointed at the middle. *Bracteas* sheathing, with the mouth from two to six-cleft. *Calyx* common *perianth* none. *Receptacle* globular, villous. *Proper perianth* above, five-cleaved. *Corol*, aggregate, equal, globular. *Corollets* numerous, funnel-shaped; *tube* very long and slender; *border* of five obovate divisions. *Filaments* scarcely any.
1 *Anthers* affixed to the mouth of the tube. Erect beneath. *Style* the length of the corol.
520 *Stigma* clavate. *Capsules* two-celled, villous. *Seeds* numerous, minute, indented from the base of the receptacle.

3. *U. pubescens*. *R.*

Leaves ovate-cordate. *Peduncles* axillary, solitary, undivided. *Corollets* long-pedicelled.

A native of the Moluccas Islands.

4. *U. cirrhiflora*. *R.*

Leaves ovate-oblong, smooth. *Stipules* bifid. *Peduncles* a continuation of the petioles of leaves.

A native of the Malay Islands.

5. U. *acida. Hunter.*

Leaves ovate, smooth. *Stipules* deeply two-cleft. *Flowers* solitary on the bracted apices of the tendrils. Page Carey Ed.

Found by Dr. Hunter on Pulo Pinang. The leaves Dr. H. observes are acid, hence the specific name.

6. U. *sclerophylla. Hunter.*

Branches four-sided, pubescent. *Leaves* elliptic, pointed, rigid. *Stipules* lunate, two-lobed. *Peduncles* axillary, solitary.

Found by Dr. Hunter on the hills of Pulo Pinang.

7. U. *sessilifructus. R.*

Leaves oblong, smooth above, soft underneath. *Peduncles* axillary, and from one to three-flowered; also terminal, and many-flowered. *Capsules* sessile.

A large scandent shrub, supported by strong, spiral, axillary hooks; a native of the forests of Chittagong. Flowering time the cool season.

8. U. *pilosa. R.* I. 521

All the tender parts very hairy. *Leaves* ovate-oblong, acuminate. *Stipules* two-parted. *Peduncles* axillary, one-flowered.

A stout scandent shrub; supported by strong, hairy, axillary, spiral hooks; a native of the forests of Chittagong, where it flowers in February and March.

RONDELETIA. Schreb. gen. N. 296.

Calyx five-toothed. *Corol* infundibuliform. *Germ* inferior, two-celled; *cells* many-seeded; *attachment* interior. *Stigma* two-cleft. *Capsules* two-celled, two-valved. *Seeds* many.

1. R. *paniculata. R.*

Arborescent. *Leaves* sub-sessile, oblong-ventricose, tapering at both ends, smooth. *Stipules* round, recurvate. *Panicles* terminal, sub-brachiate.

A native of the Malay Islands. It was brought from Amboyna by Captain Anderson, to the Botanic garden at Calcutta, where it blossoms in March, April, May and June.

Trunk straight. *Branches* decussate. *Bark* smooth, brown on the older parts; on the younger green. *Leaves* opposite, sub-sessile, oblong-ventricose, tapering at both ends, above smooth, underneath somewhat villous, entire, from four to ten inches long, and from two to four or five broad. *Stipules* within the petioles, round-reniform, recurved, smooth. *Panicles* terminal, and from the exterior axills; the former brachiate, the latter have the whole of their ramifications alternate; they are all round and villous. *Flowers* minute, pure white, very numerous, sessile, or short-pedicelled, on the short, alternate, ultimate, ramifications of the panicle. *Bractes* of the ramifications large, and of various forms; those of the flowers, several, minute; all are villous. *Calyx* villous; *segments* five, roundish. *Corol; tube* perfectly cylindric; *border* of five, ovate, revolute segments, which are much shorter than the tube. *Filaments* short, inserted into the bottom of the fissures at the border of the corol. *Anthers* ovate, incumbent. *Germ* inferior, roundish, two-celled, each containing many ovula attached to an elevated receptacle on the centre of the partition. *Style* rather longer than the tube of the corol. *Stigma* of two, large, sub-rotund, spreading lobes. *Capsules* minute, round, two-celled, two-valved, opening across the apex. *Seeds* very minute, number, shape, &c. uncertain, as they scarcely ever come to their full size. I. 522

2. R. *tinctoria. R.*

Arborescent. *Leaves* petioled, oblong-lanceolar, smooth. *Stipules* triangular, cuspidate. *Panicles* terminal, decussate. *Flowers* tern.

Beng. Toola-lodh.

A small tree, of about ten or twelve feet in height; a native of Burdwan and Midnapore, in Bengal, where it blossoms in January and February; the seeds ripen in May.

Trunk straight, rather short, about as thick as a man's leg. *Bark* covered with a dark brown, slightly cracked, spongy lamina; inwardly fibrous, yellowish, and astringent. *Branchlets* opposite; *young shoots* four-sided, and densely clothed with short, ferruginous hairs. *Leaves* opposite, rarely tern, petioled, from oblong to lanceolar, entire, smooth above, a few hairs, particularly on the nerve and veins underneath; from four to six inches long, and from one to two and half broad. *Petioles* short, and somewhat winged, arising from the decurrency of the leaves hairy. *Stipules* triangular, with ensiform apices, hairy on both sides. *Panicles* terminal, large, composed of many, opposite, compound, four-sided, hairy branches and branchlets. *Bractes* numerous, hairy; those of the ultimate divisions of the panicle ensiform, with a lanate base, and embracing three flowers; besides which each flower is furnished with a small proper bracte. *Flowers* very numerous, small, white, sub-sessile, fascicled, and on the extremities of the ramifications, always in opposite fascicles of three. *Calyx* five-toothed, hairy, permanent. *Corol* one-petalled. *Tube* slender, many times longer than the calyx. *Segments* ovate, spreading. *Filaments* very short, inserted immediately under the fissures of the division of the border of the corol, in the mouth of the tube. *Anthers* incumbent. *Germ* inferior, ovate, two-celled, each containing many *ovula* attached to the elevated centre of the partition. *Style* as long as the tube. *Stigma* two-lobed; *lobes* oblong. *Capsule* spherical, about the size of a small grain of millet, dry, brown, crowned with the remaining calyx, two-celled, two-valved, opening across the apex contrary to the partition. *Seeds* few, very minute, and imperfect, so much so that I have not been able to ascertain their internal structure. I. 523

Obs. The bark is employed by the natives as a mordant in some of their dyes, hence the specific name.

Page Carey Ed.

3. R. *exserta. R.*

Arboreous. *Leaves* petioled, broad-lanceolar. *Stipules* semi-lunar, reflexed. *Panicles* terminal. *Corol* sub-campanulate. *Stamens* exsert. *Capsules* many-seeded.

A native of the interior parts of Bengal, and particularly over the ruins of the ancient city of Gour; Mr. Henry Creighton found it there, and sent plants to the Botanic garden at Calcutta, where they thrive luxuriantly, and blossom in March, at which period they form one of its greatest ornaments.

Trunk erect. *Bark* ash-coloured. *Branches* opposite, spreading, or even drooping. *Branchlets* villous; height in ten years above twenty feet. *Leaves* opposite, petioled, broad-lanceolar, entire, soft with down on both sides; general length from four to six inches. *Petioles* short, flat on the upper side, downy. *Stipules* semi-lunar, reflexed, downy. *Panicles* terminal, very large, diffuse, ovate; *ramifications* round and downy. *Bractes* sub-ensiform, varying much in size. *Flowers* very numerous, small, pure white, fragrant. *Calyx* small, five-toothed, hoary. *Corol; tube* short, and contracted at the mouth by five elevations on the inside; the five oblong segments of the border recurved. *Filaments* from the five ribs of the tube of the corol, nearly as long as the border. *Anthers* incumbent. *Germ* beneath. *Stigma* large, two-cleft. *Capsules* minute, villous, crowned with the withered *calyx*, two-celled, opening at the apex within the calyx. *Seeds* many in each cell, small, rugose, attached to an elevated receptacle, which is attached to the middle of the partition.

I. 524

4. R. *tetrandra. R.*

Shrubby. *Leaves* lanceolate, sessile. *Stipules* pinnatifid. *Flowers* axillary, glomerate, tetrandrous. *Capsule* many-seeded.

A shrubby species; a native of Pulo Pinang.

Stem straight; *branches* erect, smooth, four-sided, with the angles sharp on the young shoots. *Leaves* opposite, sessile, lanceolate, smooth. *Stipules* sub-pinnatifid, containing the inside of the base of the leaves, tapering to an awled point. *Flowers* numerous, short-peduncled, crowded in the axills, and mixed with many, lanceolate, ciliate bractes. *Calyx, Corol, stamens* and *pistil* as in the genus. *Capsule* small, black, angular. *Seeds* numerous, immersed in the receptacles, as in a nidus.

5. R. *scandens. R.*

Shrubby, scandent, smooth. *Leaves* opposite, petioled, oblong, entire. *Panicles* axillary, small, brachiate. *Capsules* globular. *Seeds* numerous, small.

Found indigenous on the Island of Mauritius by Colonel Hardwicke in flower and with ripe seed in June and July.

MACROCNEMUM. Schreb. gen. N. 297.

Calyx five-toothed. *Corol* campanulate. *Capsule* inferior, two-celled, two-valved. *Seeds* imbricated.

I. 525

1. M. *stipulaceum. R.*

Leaves sub-sessile, lanceolate, smooth. *Stipules* oval, very large. *Corymbs* terminal, supra-decompound.

A native of the Moluccas. The mouth of the bell of the short corol is uncommonly woolly, nearly hiding the stamina.

2. M. *parviflorum. R.*

Shrubby. *Leaves* short-petioled, lanceolate, entire, smooth. *Stipules* annular, truncate. *Peduncles* axillary, many-flowered. *Corol* acetabuliform.

A native of the Moluccas.

Obs. I have seen only dried specimens of these two species.

RANDIA. Schreb. gen. N. 275.

Calyx four or five-parted. *Corol* one-petalled, four or five-parted. *Germ* inferior, two-celled; *cell* many-seeded, imbricated, attachment inferior. *Berry* two-celled. *Seeds* several, sub-imbricated. *Embryo* inverse, furnished with a perisperm.

1. R. *racemosa. R.*

Shrubby, erect. *Branches* decussate. *Leaves* oblong, smooth. *Racemes* axillary. *Flowers* tetrandrous.

Beng. Peetunga.

This plant was first discovered by Dr. F. Buchanan, growing about Lukshmee-poora; from thence he sent the seeds to the Botanic garden at Calcutta, where the plant is now common, and blossoms about the close of the rainy season.

Stem straight. *Bark* smooth. *Branches* opposite, expanding, indeed almost horizontal. *Bark* of the woody parts dark-brown, of the young shoots green, and smooth. *Leaves* opposite, drooping, short-petioled, broad-lanceolate, entire, smooth on both sides, from three to four inches long, and about one broad. *Stipules* within the leaves, large, tapering, caducous. *Spikes* axillary, for the most part solitary, sub-sessile, about one-half or one-third the length of the leaves. *Flowers* sessile, numerous, small, pale greenish white. *Bractes* one-flowered. *Calyx* four-toothed, permanent. *Corol* funnel-shaped; *border* four-parted; *mouth* of the tube villous. *Filaments* short. *Anthers* linear, half hid in the tube of the corol. *Stigma* bifid. *Germ* inferior, two-celled, with several *ovula* in each, attached to the thickened centre of the partition. *Berry* round, smooth, shining, straw-coloured, size of a pea, two-celled. *Seeds* two, three or four in each cell, attached to the upper half of the partition; shape very various. *Integument* fibrous. *Perisperm* cartilaginous. *Embryo* inverse, half the length of the peris-

I. 526

perm. *Cotyledons* linear. *Radicle* oblong, superior. Page Carey Ed.

2. R. *stricta. R.*

Shrubby, straight. *Leaves* opposite, oblong, pointed. *Flowers* axillary, sessile.

A native of the mountains north of Bengal. In the Botanic garden its flowering time is the cold season.

Stems several, straight, ornamented with numerous, cross-armed, spreading branches, down to the root; *height* of the whole from five to ten feet. *Leaves* opposite, very short-petioled, spreading, oblong, or broad-lanceolate, pointed, margins entire, but waved a little; smooth on both sides. *Stipules* connecting the petioles, on their inside, and tapering to a daggered point, pressing close upon the branchlet. *Flowers* small, white, collected in dense, globular, sessile fascicles, in the axills of the leaves. *Bractes* two or three, like the calyx, and embracing the base of the germ. *Calyx* five-parted; *divisions* acute, permanent. *Corol* contorted, inside of the short tube hairy. *Filaments* none. *Anthers* affixed a little below their apices within the tube, and in the fissures of the divisions of the border of the corol. *Germ* inferior, two-celled, with several seeds in each. *Style* short. *Stigma* large, oblong, hairy, two-cleft, but its lobes do not separate. *Berry* globular, size of a pea, smooth, two-celled. *Seeds* several in each cell, imbricated in two rows, attached to the partition above its middle. *Perisperm* conform to the seed. *Embryo* inverted. I. 527

3. R. *polysperma. R.*

Shrubby. *Leaves* oblong, entire, acuminate, smooth. *Stipules* subulate. *Spikes* panicled, axillary.

An elegant, very ramous shrub, a native of Chittagong. Flowers in May, and the seeds ripen in August and September.

SCÆVOLA. Schreb. gen. N. 300.

Calyx five-cleft. *Corol* one-petalled; *tube* longitudinally cloven on the under side, with unilateral five-cleft border. *Germ* two-celled, one-seeded; *attachment* inferior. *Drupe* inferior. *Nut* two-celled. *Embryo* erect, and furnished with a perisperm.

1. S. *Taccada. R.*

Shrubby, with smooth, succulent branches. *Leaves* sessile, obovate-cuneate, entire, shining. *Peduncles* axillary, solitary, two or three times dichotomous.

Lobelia Taccada. *Gært. fruct.* i. 119. *t.* 25.

Buglossum littoreum. *Rumph. Amb.* iv. *p.* 116. *t.* 54.

Bela modagam. *Rheed. Mal.* iv. 121. *t.* 59.

A native of most of the maritime parts of the East Indies, and introduced from Pulo Pinang into the Botanic garden at Calcutta, where there is a constant succession of flowers and fruit the whole year round. I suspect the American plant, called by Willdenow and others, *Scævola Lobelia*, to differ specifically from ours; I have therefore preferred Gærtner's specific name.

Trunk short and variously bent. *Bark* thereof, and of the old branches ash-coloured, and somewhat scabrous, large branches erect, the smaller ones nearly verticelled, ascending, and covered with smooth, green bark; general height of the whole plant about five or six feet. *Leaves* alternate, sub-sessile, long-obovate, with margins entire, apex circular, smooth, shining green on both sides; from three to six inches long. In the axill of each is found a little tuft of delicate white wool. *Peduncles* axillary, solitary, once, twice, or thrice dichotomous, the whole not above one-fourth the length of the leaves. *Pedicels* clavate, round, and smooth. *Bractes* opposite, small, conical. *Flowers* white, slightly fragrant. *Calyx* may be called five-leaved; *leaflets* rather remote, erect, or recurved, subulate, permanent. *Corol* one-petalled. *Tube* five or six times longer than the calyx, split its whole length on the side next to the branch, villous on the inside and shaggy with filaments round the mouth. *Border* of five, oblong, unilateral segments, with membranaceous, curled borders. *Filaments* from the receptacle, erect till the flowers expand, then becoming variously curled back round the base of the tube of the corol. *Anthers* oblong, crowned, before the expansion of the corol they adhere slightly to each other, round the mouth of the stigma. *Germ* inferior, obovate, torose, two-celled, with one seed in each, attached to the very bottom of the partition. *Style* length of the tube, pretty thick, recurved. *Stigma* large, funnel-shaped, very hairy on the outside, and ciliate. *Drupe* nearly round, size of a small gooseberry, when ripe white, and torulose. *Nut* two-celled, dark brown, wrinkled; between it and the white exterior pulpy covering there is a white torulose, softish cartilaginous coat. *Seed* one in each cell. *Embryo* lodged in a considerable portion of whitish *albumen*. *Cotyledons* two, oval. *Radicle* inferior, shorter than the lobes. I. 528

2. S. *oppositifolia. R.*

Leaves opposite, short-petioled, elliptic, entire, smooth. *Peduncles* axillary, few-flowered.

A native of the Moluccas; a slender shrubby species, very different in habit from S. *Kimigii*.

CINCHONA. Schreb. gen. N. 301. I. 529

Calyx five-toothed. *Corol* funnel-shaped. *Germ* inferior, two-celled; *attachment* interior. *Capsule* two-celled, with the partition parallel. *Seeds* many, imbricated, membrane-winged. *Embryo* erect, and furnished with a perisperm.

Obs. That part of the above character which makes the partition parallel does not agree

Page Carey Ed. with the only two East India species I have yet met with. In them the partition is contrary.

1. C. *excelsa. Roxb. Corom.* ii. 3. *t.* 106.

Arboreous. *Leaves* oblong, downy. *Stipules* cordate, serrate. *Panicles* terminal and axillary. *Anthers* sub-sessile in the mouth of the tube. *Partition* of the capsule contrary.

Teling. Bundaroo.

This species of *Cinchona* is a native of the mountainous parts of the Circars, and chiefly of the vallies, where it grows to be a very large tree. Flowers during the rainy season. *Seeds* ripe in four or five months after.

Trunk straight, of considerable thickness and height. *Branches* numerous, spreading. *Bark* of the trunk pretty thick; the exterior lamina is gray, light, spongy; it cracks in various directions, and frequently falls off; the middle coat is brown, of a farinaceous nature, and is as thick as both the exterior and interior coats; the interior is white, (the fresh bark is here described.) *Leaves* opposite, petioled, oblong, entire, soft, downy, particularly on the under side; *veins* simple, and frequently opposite; from six to twelve inches long, and from three to five broad. *Floral leaves*, the lower pair or two of the ramifications of the panicle are ornamented each with a pair of leaves, in shape like the rest, but much smaller, coloured, more permanent, and bullate. *Petioles* round, downy, two or three inches long. *Stipules* within the leaves, ovate-cordate, acutely serrate, erect, caducous. *Panicles* terminal, large, generally with the lower ramifications, crossed armed. *Flowers* fascicled, small, greenish-white, exceedingly numerous, exquisitely fragrant. *Calyx* superior, five-toothed. *Corol* one-petalled, funnel-formed, downy. *Tube* long. *Border* five-parted; *divisions* oval, spreading, not half the length of the tube. *Filaments* five, short, inserted into the mouth of the tube. *Anthers* erect, one-third within the tube. *Germ* oval. *Style* twice the length of the tube. *Stigma* headed. *Capsule* oblong, crowned with the remains of the calyx, about as thick as a field bean, but twice as long, four-striated, marked with small white, elevated specks, two-celled, two-valved, opening from the top; *partition* contrary. *Receptacle* slender, angular, length of the capsule, affixed lengthways to the suture of the partition. *Seeds* from six to twelve in each cell; chesnut-coloured, imbricated, oblong, compressed, enlarged all round by a membranaceous jagged wing, which at the base is split up to the seed itself.

I. 530

Obs. The infusion of one fresh leaf in water all night had little taste, but struck quickly a deep purplish blue with a chalybeate. The two inner coats of the bark (the outer light spongy stratum is tasteless,) possess both the bitterness and astringency of *Peruvian bark*, and I think when fresh in a stronger degree; the bitterness is not so quickly communicated to the taste on chewing the bark, as that of the former, but is much more durable, and chiefly about the upper part of the fauces.

The wood is firm, close-grained, of a pale mahogany colour, and very useful for many purposes.

2. C. *thyrsiflora. R.*

Arboreous. *Leaves* ovate, downy; *floral* coloured and reticulate. *Thyrses* terminal and axillary, drooping. *Stipules* oblong, fringed with coloured glands. *Border* of the corol urceolate. *Partition* of the capsule contrary.

A native of the interior parts of Bengal, where it was discovered by Dr. William Carey, and by him sent to this garden, where the trees blossom in June, and the seeds ripen in January.

I. 531

Trunk straight, covered with smooth, ash-coloured bark. *Branches* numerous, spreading, so as to form a large ovate head. *Leaves* opposite, petioled, ovate, and ovate cordate, downy; *veins* simple and parallel; *length* from two to eight or ten inches. The floral pair or two longer-petioled, somewhat scarious, smoother, and more permanent than the others. *Petioles* round, villous, about a third of the length of their leaves. *Stipules* large, oblong, downy, and fringed with coloured glands round the margin. *Thyrses* terminal, and from the exterior axills, from oblong to sub-cylindric, very dense, short-peduncled, drooping. *Flowers* small, greenish-yellow, very fragrant, collected in numerous small fascicles, on very short, common peduncles. *Bractes* linear-lanceolate, one to each fascicle, smaller ones to the proper pedicels. *Calyx* about five-toothed, villous. *Corol; tube* cylindric, more than twice the length of the calyx. *Border* five-parted, pitcher-shaped, length of the tube. *Filaments* short, inserted into the mouth of the tube. *Anthers* sagittate, hid in the pitchered border. *Germ* two-celled. *Style* twice the length of the corol. *Stigma* globular. *Capsule* inferior, oblong, warty; size of a filbert, two-celled, two-valved, opening from the apex; *partition* contrary, and in this respect only does it differ from *Cinchona*. Is this a sufficient reason to remove it from that family? In C. *excelsa*, the partition is also contrary, receptacle placed longitudinally along the suture of the partition. *Seeds* several in each cell, imbricated upwards, surrounded with a broad, brown, reticulated, membranaceous wing, which is cloven below up the umbilicus, at the base of the seed. *Perisperm* thin, white, and fleshy. *Embryo* erect, nearly as long as the perisperm. *Cotyledons* cordate. *Radicle* oval, inferior.

PSATHURA. Juss.

Calyx superior, from four to six-toothed. *Corol* one-petalled; *tube* short, and hairy within; *border* from four to six-parted. *Germ* five-celled; *cells* one-seeded; *attachment* inferior, from four to six-celled. *Nut* solitary, one-seeded. *Embryo* erect, and furnished with an ample perisperm.

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1. P. *borbonica. Willd. spec.* ii. 229.

Found indigenous on the Mauritius by Colonel Hardwicke, in flower and seed in the months of August and September; growing to the size of a small tree, with dichotomous branchlets; opposite, short-petioled, entire, smooth, oblong leaves; small axillary and terminal trichotomous corymbs of minute pentandrous flowers. *Germ* five-celled, with one ovulum in each, attached to the bottom of its cell. *Style* short. *Stigma* two-lobed. *Drupe*, the size of a pea, containing as far as five, nuciform, rugose seeds or nuts, each in its proper cell. Page Carey Ed.

DENTELLA. Schreb. gen. N. 310.

Calyx five-parted. *Corol* infundibuliform; *segments* three-toothed. *Capsule* inferior, two-celled, many-seeded.

1. D. *repens. Willd. spec.* i. 972.

Crusta ollæ. Caranasci. *Rumph. Amb.* v. 460. *t.* 170. *f.* 4.

Oldenlandia *repens. Burm. Ind.* 38. *t.* 15. *f.* 2.

A native of cool moist places, such as the shady banks of rivers, and water-courses.

Root long, rarely perennial. *Stems* many, creeping, jointed. *Leaves* opposite, short-petioled, oval, ciliate. *Flowers* in the divisions of the branches, sub-sessile, small, white. *Calyx* five-parted; *divisions* lanceolate. *Corol* five-cleft; *segments* linear, three-toothed. *Stamens* five. *Style* two-cleft near the bottom. *Capsule* hispid; *receptacles* reniform, free, affixed to the middle of the partition.

Obs. Burman's figure of this plant is bad.

PSYCHOTRIA. Schreb. gen. N. 313. I. 533

Calyx five-toothed. *Corol* tubular. *Berry* inferior, two-celled. *Seeds* solitary, grooved on the interior side.

1. P. *asiatica. Willd. spec.* i. 961.

Shrubby. *Branches* opposite, smooth. *Leaves* ovate-lanceolate, entire, acute, smooth. *Stipules* semi-lunate. *Panicles* terminal, brachiate, crowded. *Anthers* linear. *Berries* oval, ten-ribbed.

A native of the Molucca Islands.

2. P. *herbacea. Willd. spec.* i. 967. *Jacq. Amer.* 66. *t.* 46.

Herbaceous, creeping. *Leaves* round-cordate. *Stipules* semi-lunar. *Flowers* few, terminal on the little erect branchlets.

Karinta kali. *Rheed. Mal.* x. 41. *t.* 21.

Koodi munkooni, the vernacular name in Silhet, where it grows in moist places under the shade of trees, &c. Flowering time the months of May and June.

CANTHIUM. Lamarck.

Calyx four or five-toothed. *Corol* one-petalled, tubular. *Germ* two-celled, one-seeded; *attachment* sub-superior. *Drupe* inferior, two-seeded. *Embryo* inverse, and furnished with a perisperm.

1. C. *angustifolium. R.*

Shrubby, armed. *Leaves* lanceolate, lucid. *Flowers* axillary, pentandrous. *Style* length of the corol.

Beng. Kota-*mulli.*

A well armed, shrubby, very ramous species, a native of the hills in the vicinity of Chittagong, Silhet, and the whole eastern frontier of Bengal. Flowers from March till July, and probably the greater part of the year. I. 534

Trunk obscure. *Branches* numerous; *young shoots* straight, slender, firm, round and smooth. *Spines* axillary, expanding. *Leaves* on the youngest shoots in single, opposite pairs; on the older branchlets fascicled; all are short-petioled, lanceolate, entire, long, taper-pointed, firm and polished, from one inch to two and a half long, and half or three-quarters of an inch broad. *Stipules* interfoliaceous, ensiform. *Flowers* axillary, several together, small, short-peduncled, greenish-yellow. *Calyx* acetabuliform, five-angled, five-toothed. *Corol; tube* short and gibbous; *border* of five lanceolate segments. *Filaments* five, from the fissures of the corol, short. *Anthers* linear, erect, equalling the border of the corol. *Germ* inferior, turbinate, two-celled, with one ovulum in each, attached to the upper part of the partition. *Style* the length of the corol. *Stigma* large, with a bifid apex. *Drupe* inferior, sub-rotund, apex retuse, as in C. *parviflorum*, smooth, size of a black currant, when ripe yellow, two-celled, though one of the cells is frequently abortive.

2. C. *parvifolium. R.*

Shrubby, armed, hairy. *Leaves* oval, entire. *Flowers* axillary, crowded, pentandrous; *tube* of the corol globular.

The shape of the leaves alone forbids the supposing of this to be Plukenet's *Amaranthoides indicum*, verticillatum, Parietariæ hirsutis foliis aculeatum, &c. *Alm.* 27. *t.* 133. *f.* 3. Consequently it is neither *Monetia diacantha*, *Willd. spec.* i. 670. nor *Azima diacantha*, *Lamark, Encyclop.* i. 343.

It is a middling-sized, very rigid, ramous shrub, the tender shoots and under side of the leaves hairy. The inside of the tube of the corol is surrounded with a circle of straight, white bristles of its own length, inserted round its mouth, and pointing to its bottom. Flowering time the rainy season.

3. C. *parviflorum. Roxb. Corom.* i. 3. *t.* 51. *Gært. sem.* iii. 93. *t.* 196.

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Shrubby, thorns opposite, horizontal. *Leaves* opposite and fascicled. *Flowers* axillary, tetrandrous.

Kandenkara. Rheed. Mal. v. 71. *t.* 36.

Webera tetrandra. Willd. spec. i. 1224.

Teling. Balusoo *kura.*

This is one of the most common, scraggy, thorny bushes on the coast; every soil and situation suits it. Flowering time the hot season; the seeds ripen in September.

Trunk scarcely any, but branches innumerable, the smaller are regularly cross-armed, and spreading. *Thorns* simple, opposite, above the axills, spreading, cross-armed, very strong and very sharp; in luxuriant plants they are sometimes three-fold. *Leaves* on the young shoots opposite, on the older branchlets fascicled, short-petioled, reflexed, ovate, entire, smooth; size various. *Stipules* connecting, subulate. *Umbellets,* or rather *racemes* opposite, below the thorns, small, about the length of the leaves. *Peduncles* and *pedicels* smooth, round. *Flowers* small, yellow. *Calyx* above, four-toothed; *teeth* acute; permanent. *Corol* one-petalled. *Tube* gibbous, short; *mouth* downy. *Border* four-parted; *segments* ovate, expanded. *Filaments* four, in the mouth of the corol. *Anthers* ovate. *Germ* inferior, globular, two-celled, with one *ovulum* in each attached to the axis above its middle. *Style* rather longer than the tube of the corol. *Stigma* headed. *Drupe* obcordate, laterally compressed a little with a hollow on each side, size of a cherry, crowned with the remaining calyx, fleshy, smooth, yellow, two-celled. *Nuts* two, one in each cell, oblong, one-celled. *Embryo* inverse, subcylindric, a little curved, and furnished with a soft amygdaline perisperm.

Obs. The bush makes excellent fences. The ripe fruit is eaten by the natives. The leaves are universally eaten in curries; on that account the plant has the additional name *kura* which means esculent.

4. C. *didymum. Gært. carp.* iii. 94. *t.* 196.

Sub-arboreous, unarmed. *Leaves* oblong and oval. *Cymes* axillary, sub-sessile. *Flowers* pentandrous. *Style* longer than the cylindric tube of the corol, with a mitre-shaped

I. 536 stigma.

Teling. Naum-papula.

Webera cymosa. Willd. spec. i. 1224.

A small tree, a native of the interior mountains of the coast of Coromandel.

Bark smooth, on the young shoots shining green. *Leaves* opposite, short-petioled, oval, firm, smooth, of a shining deep green, about six inches long; on the under side in the axills of the principal veins are to be found the characteristic glands of the *Gardenias,* they are smooth and hollow; in the *Gardenias* they are generally surrounded with a hairy margin. *Stipules* within the leaves. *Cymes* axillary, short-peduncled, simple, or compound, bearing many small, white, very fragrant flowers. *Calyx* and *corol* as in the family. *Filaments* five, short, somewhat crooked, inserted into the downy throat of the tube of the corolla. *Anthers* incumbent, oblong. *Germ* inferior, globular. *Style* nearly twice the length of the tube. *Stigma* large, mitre-shaped. *Pericarp* a top-shaped berry, the size of a small cherry, when ripe black and shining, crowned with the calyx. *Seeds* two.

5. C. *moluccanum. R.*

Pentandrous, unarmed. *Leaves* oblong. *Style* length of the short gibbous tube of the corol. *Stigma* turbinate.

A native of the Molucca Islands.

VANGUERIA. Juss.

Calyx five-toothed. *Corol* one-petalled; *tube* gibbous; mouth shut with hairs. *Germ* five-celled; *cells* one-seeded; *attachment* interior. *Berry* inferior, five-seeded. *Embryo* inverse, and furnished with a perisperm.

1. V. *spinosa. R.*

Shrubby, armed with decussate spines.

I. 537 *Beng.* Muyna.

A small tree or large bush; a native of Bengal and also of China, I presume, as there are some plants in the Botanic garden brought thence. Flowering time the beginning of the hot season; fruit ripe in three or four months afterwards.

Trunk irregular, which with the branches is armed with strong, straight, opposite, or three-fold thorns. *Leaves* opposite, and three-fold, short-petioled, ovate-oblong, entire, smooth, from three to four inches long. *Stipules* opposite, and three-fold, within the leaves as in *Gardenia. Flowers* axillary, fascicled on a common short peduncle, with proper, longer pedicels, small, of a pale greenish colour. *Calyx* five-toothed. *Corol* one-petalled. *Tube* sub-globular; *mouth* shut with much long, white hair; *border* generally five-parted, spreading. *Filaments* five, very short, inserted into the mouth of the tube of the corol. *Anthers* small, cordate. *Germ* inferior, turbinate, four or five-celled, with one *ovulum* in each, attached to the axis a little above the middle. *Style* so long as to elevate its large glandular four or five-lobed *stigma* just above the anthers. *Berry* or rather *drupe* round, turbinate, size of a cherry, smooth, when ripe yellow, succulent, and edible. *Seeds* four or five, obliquely oblong, inner edge narrower and straight. *Integuments* two; *exterior* a hard, dark-coloured nut; *interior* membranaceous. *Perisperm* conform to the seeds, amygdaline. *Embryo* inverse, a little curved. *Cotyledons* scarcely so long as the radicle, lanceolate. *Radicle* columnar, superior.

Obs. The fruit is eaten by the natives. Its flowers come exceedingly near to those

of my *Canthium parviflorum*, as does also the whole habit of the plant.

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LONICERA. Schreb. gen. N. 319.

Corol one-petalled, irregular. *Berry* inferior, two-celled, many-seeded.

1. L. *quinquelocularis. Hardwicke* in *Asiat. Res.* vi. 351. I. 538

Shrubby. *Leaves* petioled, elliptic, acute, entire, villous. *Peduncles* axillary, solitary, short, two-flowered. *Berries* five-celled.

Found by Colonel Hardwicke, in vallies about Adwanee on his tour to Shreenugura, and there called *Lung-phool* by the natives.

TRIOSTEUM. Schreb. gen. N. 320.

Calyx five-parted, equalling the one-petalled corol. *Corol* with the border divided into five sub-equal segments. *Berry* inferior, one-celled. *Seeds* from three to five, pyrenous.

1. T. *hirsutum. R.*

Shrubby, hirsute. *Leaves* short-petioled, lanceolar, entire, acuminate. *Flowers* axillary, sessile, much shorter than their numerous lanceolar bractes. *Berries* five-seeded.

A native of Chittagong, where it flowers during the hot season; seed ripe in June and July.

COFFEA. Schreb. gen. N. 314.

Corol funnel-shaped. *Germ* two-celled, one-seeded; *attachment* of the ovula interior. *Berry* inferior, two-celled, one-seeded. *Seeds* arilled. *Embryo* erect, and furnished with a perisperm.

1. C. *tetrandra. R.*

Shrubby. *Leaves* broad-lanceolar, acute, lucid. *Stipules* bifid. *Peduncles* axillary and terminal, several together, long, slender, one-flowered. *Flowers* tetrandrous. *Corol* with long, slender tube and border.

Beng. Chilmaree.

An erect, slender, ramous shrub, a native of Silhet, Chittagong, and the whole east border of Bengal, where it flowers in May, and the seeds ripen in October and November. I. 539

Branchlets opposite, round, smooth, and slender. *Leaves* opposite, short-petioled, broad-lanceolar, entire, acuminate, smooth, and glossy on both sides; from four to five inches long, and scarcely two broad. *Stipules* generally bifid. *Segments* subulate. *Peduncles* terminal and axillary, several together, long, slender, straight, one-flowered. *Calyx* four or five-toothed. *Tube* of the corol long, slender, somewhat clavate, smooth; *segments* of the border four or five, length of the tube, ensiform, spreading. *Filaments* scarcely any. *Anthers* four or five, linear, inserted within the tube, their apices even with its mouth. *Germ* inferior, turbinate, two-celled, with one *ovulum* in each cell, attached to the middle of the partition. *Style* two-cleft. *Stigmas* simple. *Berry* inferior, round, size of a small cherry, smooth, when ripe blackish purple, and with but a small portion of pulp, one or two-celled; generally one-celled, the other cell being abortive, and then the berry has an oblique direction. *Seeds* solitary, when the berry is two-celled nearly round; when one-celled, flat on one side and convex on the other, in which case there is a deep round cavity on the flat side. *Perisperm* conform to the seed, horny. *Embryo* erect, very small, and lodged in an oblique direction in the middle of the convex side of the perisperm, with the two reniform *cotyledons* pointing up and in, the oblong radicle out and down.

2. C. *arabica. Willd. spec.* i. 973.

Leaves oblong, ovate, acuminate. *Flowers* axillary, crowded. *Stamina* without the tube of the quinquifid corol.

Coffee. *Fothergill's Works.* ii. *p.* 279. *t.* 3.

A native of Arabia, and now common in both Indies. In Bengal it blossoms in March, and the berries ripen in December.

In the West Indies Coffee plants are said to produce on an average from six to sixteen ounces of clear coffee annually. *Fothergill's Works*, ii. *p.* 323. At St. Domingo they calculate on one pound per plant. At Jamaica one pound and a half, and at Terra-Firma two pounds, where the plants stand in quincunx, at from four to eight feet according to the richness of the soil. *English Translation of Depon's Travels in South America*, i. 434. 1809-10. Two middling plants at the age of six or seven years produced in the Botanic garden in one year or crop, seven pounds of the dry berries which gave three pounds of clean coffee, equal to the Jamaica produce. I. 540

3. C. *bengalensis. R.*

Shrubby. *Leaves* opposite, oblong. *Flowers* axillary. *Segments* of the corol oblong. *Filaments* none. *Anthers* long and within the tube.

This is evidently distinct from C. *arabica*. It is found indigenous amongst the mountains of the north-east frontier, chiefly about Silhet, and from thence brought many years ago to Calcutta where it was for some time much cultivated under the idea of its being the real coffee of Arabia. It is now neglected, being of an inferior quality, and not productive; however the number and beauty of its flowers entitle it to a conspicuous place in the flower garden. Flowering time the beginning of the hot season.

Root ramous. *Trunk* short, and clothed with innumerable, horizontal, opposite branches, and branchlets, to the surface of the earth, forming, in our gardens, a pyramidical bush of

Page Carey Ed. from four to six feet in height. *Leaves* opposite, sub-sessile, from ovate to oblong; smooth on both sides, obtuse, pointed as in C. *arabica* (both are now before me just taken from the plants,) here are also pores in the axills of the nerves on the under side. *Stipules* within, subulate. *Flowers* in the axills of the leaves, and of the young shoots, sub-sessile, pure white, generally from one to three, though sometimes more. Margin of the *calyx* crowned with an undetermined number of minute points. *Corol* contorted; *divisions* of the border oblique, oval. *Filaments* none. *Anthers* long, linear, within the tube, with their incurved apices just above its mouth. *Germ* turbinate. *Style* not quite half the length of the tube. *Stigma* two-cleft; *divisions* nearly as long as the style. *Berry* two-seeded, size of a small cherry, when ripe black.

I. 541

4. C. *pedunculata. R.*

Shrubby. *Leaves* elliptic, sub-sessile, smooth, and entire. *Peduncles* terminal, and axillary, many together, long, one-flowered. *Stamina* within the slender, smooth tube of the corol.

A native of the Moluccas.

5. C. *angustifolia. R.*

Leaves lanceolate, entire, firm, and polished. *Panicles* axillary, mouth of the corol hairy; *segments* of the border linear, longer than the tube, and about as long as the filiform, exsert anthers.

A native of Pigeon Island, one of the Malay Archipelago.

MORINDA. Schreb. gen. N. 317.

Flowers aggregate. *Calyx* superior, five-toothed. *Corol* funnel-shaped. *Germ* from two to four-celled; *cells* one or two-seeded; *attachment* interior. *Stigma* two-cleft. *Berries* aggregate. *Embryo* erect, and furnished with a perisperm.

1. M. *citrifolia. Willd. spec.* i. 992. *Gært. carp.* i. 144. *t.* 29.

Arboreous, with a straight trunk. *Leaves* oblong, lucid. *Peduncles* on the upper side of the branchlets, solitary, opposite to every other solitary leaf, with a pair between. *Anthers* half hid in the mouth of the tube. *Fruit* ovate, glossy, white.

Cada-pilava. *Rheed. Mal.* i. 97. *t.* 52. good.

I. 542

Banducus latifolia. *Rumph. Amb.* iii. 158. *t.* 99.

An elegant small tree, with straight trunk, and numerous, decussated, assurgent branches, a position they generally take from the weight of the fruit, and constant exuberant foliage. From Pegu it has been introduced into the Botanic garden at Calcutta, where it is in constant fruit, and flower the whole year. It does not appear to be a native of Bengal, nor did I ever meet with it on the coast of Coromandel; but the species which I formerly considered as *citrifolia* is common in both countries, and the description and drawings thereof were sent to the Honourable the Court of Directors. That species, which however is quite distinct, I now call *tinctoria*, as it is the sort most in use for dyeing.

Bark of young trees, or their trunk, light ash-coloured and smooth; *young shoots* somewhat four-cornered, smooth and lucid. *Leaves* opposite to each other, or to a peduncle, short-petioled, from oblong to oval, lucid, entire, rather obtuse; from five to ten inches long, and from three to five broad. *Stipules* large, semi-lunar, entire, smooth. *Peduncles* solitary, opposite to a solitary leaf on the upper side of the branchlets, erect, short, cylindric, smooth, each supporting a small aggregate head of small white flowers. *Calyx* an entire margin round the apex of the germ. *Corol* funnel-shaped; *mouth* of the tube hairy. *Border* five-parted, segments lanceolate, acute. *Filaments* five, woolly, inserted into the tube of the corol, a little above its middle. *Anthers* linear, erect, half hid in the tube. *Germs* firmly united, single, two-celled, each cell containing two *ovula*, attached to opposite ends of the wings of the large, thick, fleshy partition. *Style* length of the tube of the corol. *Stigma* two-cleft. *Berries* compound, size of a pullet's egg or even longer, obtuse, when ripe pale white, polished, and succulent, as described and figured by *Gærtner*.

I. 543

Obs. Its roots are employed by the natives like those of several other species to dye red.

2. M. *tinctoria. R.*

Leaves oblong, sub-sessile, opposite to each other, or to the solitary one-flowered peduncles. *Stamina* enclosed. *Stigma* exsert.

Sans. Uchyoota.

Hind. and *Beng.* Ach. See *Asiat. Res.* iv. 35—44.

Teling. Tagaroo.

This small tree I have found pretty common in every part of India, where I have been. It is in flower and fruit the greater part, if not the whole of the year.

Trunk seldom straight, and only a few feet in height, but supporting a pretty large, ramous, shady head. *Bark* covered with an ash-coloured, deeply-cracked, corky crust. *Leaves* opposite, except where there is a peduncle, in that case, solitary, the peduncle occupying the place of the other leaf, short-petioled, oblong, entire, smooth on both sides, but not lucid like *citrifolia*, pale underneath, from six to ten inches long. *Stipules* within the leaves, as in the other *Rubiaceæ*. *Peduncles* leaf-opposite, expanding, about an inch long, supporting an oval head of aggregate, pure white, Jasmine-like, fragrant flowers. *Calyx* as in the genus.

The compound fruit is well described by Gærtner in his description and figures of M. *citrifolia*.

Obs. The *bark* of the roots is used to dye red, the colour is fixed with alum, but it is neither bright nor durable. In some parts of India it is cultivated for the sake of the roots; see *Asiat. Res.* iv. In the Circars the dyers use the bark of the fresh roots bruised and gently boiled in water for a short time, the cloth or yarn is prepared in a cold infusion of the powder-

ed gall of *Terminalia Chebula*, in milk and water; it is then dried and moistened with alum water, and again dried, and receives from the above decoction, a pretty bright, but fugitive red. Page Carey Ed.

The green fruits are picked by the Hindoos, and eaten with their curries. The wood is hard and very durable, variegated with red and white, it is employed for gun-stocks in preference to all other kinds. I. 544

3. M. *bracteata. R.*

Arboreous, straight. *Leaves* opposite to each other or to a peduncle, oblong, polished. *Anthers* within the woolly mouth of the tube. *Stigma* exsert. *Heads* bracted.

Bancudus angustifolia. *Rumph. Amb.* iii. *p.* 157. *t.* 98. has the process of the calyx of my plant, but I cannot say they agree in other respects.

It is a native of the Ganjam district; from thence Mr. Snodgrass sent the seeds to the Botanic garden at Calcutta, where the tree thrives well, and is in blossom during the hot and rainy seasons.

Trunk straight. *Branches* opposite, decussate, smooth. *Leaves* opposite to each other or to a peduncle, short-petioled, oblong, acute, smooth, polished, deep green on both sides, margins entire, length from six to twelve inches. *Stipules* large, with semi-circular apices. *Peduncles* solitary, and always opposite to a leaf, round, smooth, from one to two inches long, supporting a single, small head, of small pure white flowers. In *tinctoria* and *exserta* the peduncle is often in the axill of a small leaf, which stands opposed to the large one. *Calyx; perianth proper*, a tumid margin round the crown of the germ, frequently a small portion thereof grows to be a long linear-lanceolate, permanent leaflet. *Corol* funnel-shaped; *mouth* of the tube very woolly. *Filaments* short. *Anthers* linear, lodged amongst the wool, but entirely within the mouth of the tube. *Stigma* two-cleft, and elevated about the mouth of the tube. *Berry* aggregate, size varying from that of a crab-apple, to that of a small nutmeg, single berries several, obovate, size of a pea with a round eye on the apex. *Nut* or seeds four, the shell or cover uniformly convex on the outside, and on the inside concave, with an elevated convexity near the top which covers a void cell, the fertile cell occupies the whole length, and nearly the whole breadth of the nut, (for so I may call the hard, smooth, brown integument of which it is formed,) but is much compressed. I. 545

Obs. I have not learned that the root of this species is used in dyeing, but have no doubt of its possessing qualities similar to the roots of all the other species of the genus that I have yet met with.

4. M. *exserta. R.*

Arboreous. *Leaves* opposite to each other or to a peduncle, ovate, pointed. *Stamens* above the tube. *Stigma* rather within.

Beng. Bhun-autch, or Bun-aal.

A tree of rather small stature; a native of Bengal. Flowering time the hot and rainy season; seed ripe in about twelve or thirteen months afterwards.

Trunk from six to twelve feet high, often variously bent, and covered with deep cracked, spongy, ash-coloured bark. *Branches* spreading in every direction; *branchlets* opposite, smooth; *young shoots* somewhat four-sided, in some plants smooth, in others villous. *Leaves* opposite, short-petioled, oval, or ventricose-oval, pointed, margins entire, but waved; in some plants smooth, of a deep shining green on both sides; in others downy, from four to six inches long, and from three to four broad. *Stipules* interfoliaceous, entire, emarginate or bifid. *Peduncles* generally solitary, though sometimes there are two together, leaf-opposed, or in the axill of a small leaf, opposed to one of the usual size, round, smooth, about an inch long, each supporting a round aggregate head of many pure white, Jasmine-like flowers. In very luxuriant young plants I have found the peduncles two or even three-cleft, with a head of flowers on each division. *Calyx* scarcely any. *Corol* funnel-shaped. *Border* of five, equal, lanceolate, fleshy, expanding divisions. *Filaments* inserted on the mouth of the tube, in the division of its margin; erect. *Anthers* linear. *Germ* beneath, four-celled, with one ovule. *Style* length of the tube of the corol. *Stigma* even with its mouth and two-cleft. *Berry* (rather drupe) aggregate, oval. *Seeds* or *nut* regularly four and distinct to each proper berry, forming a square, inserted pyramid, each one-seeded. Here the abortive cell is scarcely visible. I. 546

Obs. This species is immediately known by its exsert stamens, half-concealed stigma, and broad-pointed leaves. In all the other species figured and described by me, viz. *citrifolia*, *tinctoria*, *bracteata*, *multiflora*, and *angustiflora* the stamens are enclosed, and the style exserted.

5. M. *multiflora. R.*

Sub-arboreous. *Leaves* opposite, oblong-ventricose, downy. *Peduncles* terminal and leaf-opposed, compound. *Anthers* within; *stigma* exsert.

Aal the vernacular name at Nagpore.

A native of Berar. From Nagpore the seed was sent by Mr. Colebrooke, Resident at the Court of Rughoojee Bunsla, to the Botanic garden at Calcutta in 1801. By the close of the same year the plants were in blossom, and in one year more they have grown to large ramous shrubs, and now in eight years they are small trees and in constant flower; I may farther remark that notwithstanding all the other four species of *Morinda* already described and figured by me, grow to be small trees, they generally blossom the first year of their growth if the soil is good and the plants taken good care of.

Leaves very short-petioled, opposite, or opposite to a peduncle, oval, tapering at each end, acute, margins waved, downy on both sides, particularly underneath; from four to

Page Carey Ed. six inches long, and from two to three broad. *Stipules* interfoliaceous. *Peduncles* variously disposed, viz. axillary, opposite to a leaf, and terminal, one or more from the same place, and often compound; round, villous, from two to four inches long. *Heads* sub-globular, many-flowered. *Receptacles, calyx* and *corol* as in the genus. *Filaments* short. *Anthers*
I. linear, their apices even with the mouth of the tube of the corol. *Stigma* two-cleft, and
547 extended considerably beyond the anthers. *Berry*, rather *drupe*, aggregate, ovate-oblong; surface very unequal, size of a large mulberry. *Seeds* or *nuts* regularly four to each proper berry or drupe of the compound fruit, obliquely wedge-shaped; three-celled, two of them empty, the third with a single seed, as accurately described and figured by *Gærtner* in *Morinda citrifolia.*

Obs. This plant is cultivated about Nagpore as the other species are in various other parts of India, and for the same purpose, (see *Asiat. Res.* iv. 35—44.)

6. M. *angustifolia. R.*

Shrubby, erect. *Leaves* opposite to each other or to a peduncle, lanceolar, bullate. *Heads* solitary. *Flowers* numerous. *Anthers* concealed deep within the tube; *stigma* exsert. *Berries* distinct, on a glomerate receptacle, succulent, four-seeded.

An erect, thinly branched shrub, was found at Chittagong by Dr. Buchanan, and from thence sent to the Botanic garden at Calcutta in 1798, where it blossoms in March, and the seeds ripen in May.

Trunk straight, with a few erect branches. *Bark* light ash-coloured; height of the whole plant about four or five feet. *Leaves* opposite, or single when a peduncle occupies the place of the other, sub-sessile, recurved, lanceolate, bullate, smooth, entire, about six inches long and less than two wide. *Stipules* opposite, sub-cordate, interfoliaceous, united into a ring and remaining long after their respective leaves drop. *Peduncles* solitary, short, seemingly terminal when they begin to blossom, but soon after the branchlet shoots out from between each peduncle and its respective opposite leaf, which marks their proper situation to be oppositifolius. *Heads* solitary, globular, many, viz. from fifty to a hundred-flowered. *Flowers* pure white, in size and shape like those of the common *Jasmine.* *Calyx* merely an almost entire,
I. marginal ring round the base of the tube of the corol. *Corol* funnel-shaped. *Filaments* short,
548 inserted rather below the middle of the tube of the corol. *Anthers* linear, hid in the middle of the tube. *Stigma* exsert, two-lobed. *Berries* in general distinct, but a small proportion of them only comes to perfection, sessile, the size of a large pea, succulent, deep shining black, with very dark-coloured pulp. *Seeds* four; each two-celled, with the inner cell large and empty.

Obs. The root of this shrub is also used in dyeing by the natives of India where the plant is in plenty.

7. N. *scandens. R.**

Shrubby, scandent; *leaves* oblong, lanceolate. *Umbels* terminal, simple, berries round, three or six-seeded.

A stout scandent shrub of several fathoms in extent, found common in the hills which from the east side of Point de Galle Bay or harbour. In flower and fruit in March, (1813.)

LORANTHUS.† *Schreb. gen. N.* 600.

Calyx uncertain. *Corol* generally one-petalled, and often irregular. *Germ* inferior, one-celled, one-seeded; *attachment* superior. *Berry* one-seeded. *Embryo* inverse, and furnished with a perisperm.

1. L. *bicolor. Roxb. Corom.* ii. 19. *tab.* 139.

Leaves opposite; oblong, smooth. *Racemes* axillary. *Corols* irregular, five-cleft. *Stamens* five. *Berry* oblong.

I. *Sans.* Vanda,‡ Vrikshadanee, Vrikshabhuksha, and Vrikshurooha.
549 *Hind.* and *Beng.* Bura-manda.

Yellinga-wadinika of the Telingas; (wadinika means parasitical.)

Is always found growing upon the branches of various kinds of trees, and is very ramous. *Flowers* during the greatest part of the year, and is highly ornamental.

Trunk scarcely any. *Branches* numerous, ascending, woody; *bark* gray. *Leaves* nearly opposite, sessile, or very short-petioled, from oval to linear-lanceolate, waved, entire, reclined, veins scarcely any; from three to five inches long, and from half an inch to an inch and a half broad. *Racemes* axillary, single, simple, sub-erect, many-flowered. *Flowers* in size and appearance very much like those of the honey-suckle. *Bractes*, a small, concave, cordate one, pressing on the base of the germs on one side. *Calyx*, there is no other *perianth* of the fruit than the above-mentioned bracte; that of the flower is cup-shaped, entire, permanent. *Corol* one-petalled. *Tube* long, a little curved, swelling from the bottom to within a third of the mouth, then contracting a little; *border* five-parted, upper fissures much the deepest; *segments* linear, reflexed towards one side. *Filaments* five, from the base of the segments of the corol, short. *Anthers* linear. *Germ* inferior, naked. *Style* length of the corol. *Stigma*

* This plant was discovered by Dr. Roxburgh on his last voyage to England, and the accompanying short description was sent to me from Ceylon.—W. C.

† This genus is usually placed in Hexandria Monogynia, but as Dr. Roxburgh in the last copy he made of the Flora Indica, before he left this country, removed it to Pentandria, it is printed where he then placed it.—W. C.

‡ Sir William Jones thought Vanda to be the general term for all *parasitic* plants. It is probable that all the names here cited are so.—W. C.

clubbed. *Berry* inferior, crowned with the remaining calyx, oblong, smooth, pulpy, one-celled. *Seeds* single.

Obs. This a handsome looking parasite, bearing a great number of very beautiful flowers; its foliage also looks very well. All that part of the branch of the tree above where it grows, becomes sickly and soon perishes.

It should be compared with L. *longiflorus*. It differs from Gærtner's *Lonicera zeylanica* in not having the calyx of the fruit, and in having only five parts in the corol; but in the racemes they agree. I cannot reconcile it with L. *falcatus* of Linnæus's *supplementum*, nor with L. *loniceroides*, Linn. for here the inflorescence bears no resemblance to an involucred umbel. Neither can it be L. *pentandrus*, as there the leaves are alternate, with petioles nearly as long as the racemes; in short I cannot well reconcile it to any of the hitherto described species. It unites the two genera of *Loranthus* and *Lonicera*. In Bengal I have found it with leaves from five to six inches long, and four or five broad.

2. L. *Scurrula. Willd. spec.* ii. 232.—*Roxb. Coromb.* ii. 19. *tab.* 140.

Leaves opposite, ovate, underneath downy. *Flowers* axillary, fascicled. *Corol* irregular, four-cleft; *stamens* four. *Berries* turbinate.

The Telingas have no other name for this than *Wadinika*.

It is also a parasitical shrub, but considerably smaller than the last and much more scarce; grows upon branches of trees in the same manner. Flowers during the wet season.

Leaves opposite, petioled, cordate, scolloped, covered with soft, white down underneath; about two inches long, and one and a half broad. *Peduncles* numerous, collected in the axills, one or more-flowered. *Flowers* considerably smaller than in the last species, of a rusty gray colour, and covered with gray farinaceous dust. *Bractes* one, pressing on the germ as in the last. *Călyx* of the fruit no other than the bracte of the flower, as in the former. *Corol* one-petalled; *tube* swelled towards the base. *Border* four-parted, upper fissure deepest; *divisions* linear, reflexed; *stamens* four, the *pistil* as in the last species. *Berry* top-shaped, one-seeded.

3. L. *globosus. R.*

Leaves opposite, oblong, smooth; *spikes* axillary. *Corols* regular, six-cleft. *Berries* round, oval.

Kenneli-itti-kanni. *Rheed. Mal.* x. 9. *tab.* 5.

Beng. Chhota-manda.

A ramous shrubby parasitic, like the two species already described; grows common on trees throughout Bengal. Flowers all the year.

Leaves generally opposite, though sometimes alternate, and also three-fold, short-petioled, oblong, smooth, entire, of a thick leathery texture, almost veinless; from two to three inches long. *Racemes*, or rather spikes, axillary, or between the leaves, or from the old axills, generally solitary, though sometimes there are two or even three together, much shorter than the leaves. *Flowers* opposite, from three to six pairs on the spike, sessile, small, greenish orange colour. *Bractes* no other than the perianth of the fruit. *Calyx. Perianth* of the fruit inferior, two-leaved, the under and exterior cordate, the inner two-toothed; that of the flower no other than the circular margin of the pit which receives the flower. *Corol* one-petalled; *tube* gibbous, six-sided. *Border* six-parted, divisions alike, and cut equally deep, reflected. *Filaments* six, erect, inserted into the base of the divisions of the corol. *Germ* ovate. *Style* the length of the stamens. *Stigma* large, glandular, navelled. *Berry* inferior, round, oval, size of a pea, smooth, when ripe the pulp is yellow, clammy, and elastic, which makes them adhere to the branches of trees where they germinate, resting on three permanent calyciform bractes and crowned with a ring where the corol stood round the permanent base of the style, one-celled. *Seeds* solitary, conform to the berry. *Integument* single, white, tough, and clammy, marked with twelve whitish striæ. *Perisperm* conform to the seed, six-grooved, green. *Embryo* central, inverse, straight, pale green, nearly as long as the perisperm. *Cotyledons* two, linear-oblong. *Plumula* minute. *Radicle* sub-cylindric, length of the cotyledons, superior.

4. L. *ferrugineus. R.*

Young shoots as well as the under side of the oval *leaves* long, slender, tetrandrous, regular; *flower, fruit,* and *pedicels* clothed with much ferruginous pubescence.

Found by Mr. W. Roxburgh growing on trees in the forests of Pulo Pinang.

5. L. *involucratus. R.*

Leaves opposite, ovate-cordate, smooth. *Umbellets* axillary. *Involucres* four-leaved, four-flowered; *flowers* regular, pentandrous.

A stout parasitical shrub, found on trees in the forests on the eastern border of Bengal, where it blossoms great part of the year.

Branches while young clothed with smooth, shining, dark-brown bark. *Leaves* opposite, short-petioled, ovate and ovate-cordate, sides often unequal, as in most of the plants of this genus, entire, smooth on both sides; from three to four inches long. *Umbellets* axillary, crowded, sub-sessile, much shorter than the leaves. *Involucres* four-leaved, four-flowered; *leaflets* ovate-lanceolate, smooth, entire. *Flowers* sessile, pretty large, equalling the involucre. *Calyx* superior, short, five-toothed, villous. *Corol; tube* widening toward the mouth, villous. *Border* regular, five-parted; *segments* linear, revolute. *Filaments* equalling the segments of the corol, and inserted on them below their middle. *Anthers* oval. *Germ* oval, sericeous. *Style* rather longer than the corol. *Stigma* two-lobed.

6. L. *ampullaceus. R.*

Leaves opposite, oblong, polished. *Racemes* axillary simple. *Flowers* calyced, regular, hexandrous; *tube* of the corol gibbous. *Berries* long, oval.

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Found on trees in the forests of Silhet, but seems to prefer the mango tree to all others. Flowers in the dry season, probably the whole year round.

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Stems as in our other Indian species, the size and shape very uncertain, but numerous, bifid, trifid, or quadrifid, smooth; *branches* and *branchlets* spread in all directions. *Leaves* opposite, short-petioled, oblong, entire, smooth, from three to four inches long, and generally less than two in breadth. *Racemes* axillary, solitary, or in pairs, much shorter than the leaves. *Flowers* opposite, short-pedicelled, pretty large, greenish yellow. *Bractes* oval, one at the base of each pedicel, and two pressing the base of the germ like an inferior, bifid calyx. *Calyx* superior, entire, rotate. *Corol* regular; *tube* gibbous; *border* six-cleft; *divisions* revolute, somewhat spatulate. *Filaments* six, from the mouth of the tube of the corol, length of its segments. *Anthers* ovate. *Germ* inferior, one-celled, and containing one ovule attached to the top of the cell. *Style* longer than the corol. *Stigma* large. *Berry* inferior, long-oval, smooth, yellow, size of a currant, one-celled. *Pulp* pale yellow, very clammy. *Seeds* solitary, ovate. *Integuments* two; *exterior* marked with six longitudinal fibres; *inner* membranaceous. *Perisperm* conform to the seed, six-grooved, green. *Embryo* cylindric, inverse. *Cotyledons* short, semi-cylindric. *Radicle* cylindric, with a turbinate apex rising above the perisperm, inverse.

7. L. *clavatus*. *R.*

Leaves opposite, broad-lanceolate. *Flowers* axillary, few together, tetrandrous; *corols* irregular, four-cleft; *berries* clavate.

A delicate, shrubby parasite; found in the Silhet district growing on *Averrhoa Carambola*.

8. L. *pentapetalus*. *R.*

Leaves opposite, from lanceolate to oval-cordate, and obliquely attenuate, smooth. *Racemes* axillary. *Flowers* pentandrous; *petals* five, with enlarged, three-sided base.

A large, very ramous, shrubby plant, found growing on various trees in the forests of Silhet. Flowers appearing about the beginning of the rains in June.

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Branches and *branchlets* columnar and quite smooth. *Leaves* opposite, petioled, from lanceolate to ovate-cordate, obliquely attenuate from the middle to the apex, entire, smooth, from three to four inches long, and about two broad. *Racemes* axillary, solitary, or paired, straight, simple, often as long as the leaves, smooth. *Flowers* very numerous, short-pedicelled, small, scattered, red. *Bractes*, an oval one embraces the base of the germ on the outside. *Calyx* superior, rather small, sub-entire, smooth. *Petals* five, the base of each swelled out into a fleshy, three-sided body, giving to the bottom of the corol a globular form and meeting in the centre, leaving only a small aperture for the style; above tongue-shaped, and recurved. *Filaments* five, inserted on the petals; *anthers* obovate. *Germ* oblong, one-celled, and containing one ovule, pendulous from the top of the cell. *Style* four-sided, jointed, or appearing so near the middle. *Stigma* a little enlarged. *Berries* oblong, smooth, greenish-yellow, one-seeded.

HAMILTONIA. *Roxb.*

Calyx five-cleft. *Corol* infundibuliform. *Germ* one-celled, five-seeded; *attachment* of the ovula inferior. *Stigma* five-cleft. *Capsules* inferior, one-celled, five-valved. *Seeds* five, lattice-arilled. *Embryo* erect, and furnished with a perisperm.

1. H. *suaveolens*. *R.*

Shrubby. *Leaves* opposite, broad-lanceolar. *Flowers* in terminal, umbelliform heads.

This charming, fragrant-flowered shrub was found wild on the Rajmuhal hills by Mr. William Roxburgh, jun. and by him introduced into the Botanic garden at Calcutta, where it blossoms during the cold season. It is named after Mr. William Hamilton of the Wood-lands near Philadelphia in North America, an eminent botanist, and the first who was at the ex-

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pense of erecting a conservatory in that country for the preservation of the plants of a hot climate. To this gentleman the Botanic garden at Calcutta is under the greatest obligation for having enriching it with many of the choicest plants of the New World.

Stem stout, shrubby; *branches* opposite, cross-armed, ascending. *Bark* of the ligneous parts ash-coloured, with dark purple specks; general height from six to ten feet. *Leaves* opposite, short-petioled, broad-lanceolate, smooth, entire, from three to six inches long. *Stipules* or rather connecting membranes broad, ensiform. *Flowers* sessile, in terminal corymbiform heads, on short, trichotomous branchlets, numerous, pure white, and delightfully fragrant. *Bractes* ensiform, villous; several surrounding each fascicle or head of flowers, as well as intermixed amongst them. *Calyx* superior, five-cleft, permanent; *divisions* subulate. *Corol* one-petalled, funnel-shaped. *Tube* slender, widening a little towards the mouth. *Border* consisting of five, spreading, oblong divisions. *Filaments* five, very short, inserted into the tube of the corol a little within its mouth. *Anthers* half-erect, linear. *Germ* inferior, one-celled, and containing five distinct chambers attached to the bottom of the cell, which now, thick and succulent, become the net-like aril of the ripe seed; each chamber contains one ovulum attached to its bottom. *Capsules* the size of a pea, oblong, crowned with the calyx, one-celled, five-valved, opening from the apex. *Seeds* five when all come to maturity, which is very seldom the case, their shape differing according to the number attached to the bottom of the cell, each enveloped in a beautiful, dry net-like aril. *Integument* single, dark blackish-brown, friable. *Perisperm* in very small quantity, indeed it may be called an *inner integument*. *Embryo* conform to the seed, erect; *cotyledons* two, cordate, foliaceous, with a doubling down the middle. *Plumula* minute. *Radicle* oblong, inferior, pointing to the umbilicus. Compare with *Psathura*, *Gært. carp.* iii. 83. *t.* 194.

2. H. *pilosa. R.*

Shrubby, straight, exceedingly hairy. *Leaves* opposite, short-petioled, lanceolate, entire. I. 556
Flowers in axillary fascicles, mixed amongst many long, very hairy bractes.

A native of the Moluccas.

MUSSAENDA. Schreb. gen. N. 326.

Calyx five-cleft. *Corol* funnel-shaped. *Stamina* within the tube. *Germ* inferior, two-celled; *cells* many-seeded; *attachment* of the ovula two jugiform receptacles, inserted on the partition. *Stigma* two-cleft. *Capsules* two-celled, three-valved. *Seeds* numerous.

1. M. *corymbosa. Roxb.*

Shrubby, erect. *Corymbs* terminal. *Leaves* oblong, smooth.

Native of Ceylon, Malabar, &c. In the Botanic garden at Calcutta it grows to be a stout, rigidly erect, ramous shrub, and is in blossom during the rains, at which time few plants surpass it in beauty.

Trunk straight; *branches* many, decussate. *Bark* smooth. *Leaves* opposite, short-petioled, oblong, pointed, entire, smooth on both sides, from six to nine inches long, and from three to four broad. *Involucre* or *floral leaves* long-petioled, generally one to each primary division of the corymb, of an oval form, acute, pure white, smooth on both sides, five or seven-nerved. *Petioles* of the floral leaves long, slender, drooping, inserted on the apex of the germ, forming one of the divisions of the calyx. *Stipules* within the leaves, from a broad cordate base, tapering to an acute point. *Corymbs* terminal, compound and decompound, smooth. *Bractes* ovate-lanceolate. *Flowers* numerous, and uncommonly beautiful. *Calyx* five-parted; *divisions* erect, bristle-shaped, smooth. *Corol* funnel-shaped. *Tube* slender, more than twice the length of the calyx, swelled a little about the middle, where the stamens are lodged; *mouth* closed with orange-coloured hair. *Border* of five ovate, fleshy, I. pointed, spreading divisions, on the upper side convex, villous, of a deep but bright orange 557 colour, and greenish underneath. *Filaments* five, short, inserted into the middle of the tube. *Anthers* linear, hid in the tube. *Germ* inferior, two-celled; *ovula* numerous, on a pedicelled jugiform receptacle, projecting above the insertion and far below it. *Style* half the length of the tube of the corol. *Stigmas* two. *Capsule* oval, two-celled, two-valved. *Seeds* numerous.

Obs. In some parts of India the white floral leaves are brought to table as an esculent herb.

2. M. *frondosa. Willd. sp.* i. 997.

Shrubby, erect. *Leaves* oblong, acuminate, villous. *Panicles* terminal, dichotomous, villous.

M. Zeylanica. *Burm. Zeyl.* 165. *t.* 76.

Belilla. *Rheed. Mal.* ii. 27. *tab.* 17.

A native of various parts of India; in the Botanic garden at Calcutta it grows to be a pretty large shrub, but with few branches, at least when compared to the preceding species, but the flowers, which appear about the end of the rains and beginning of the cool season, are larger and of a brighter colour.

BAEOBOTRYS. Schreb. gen. N. 318.

Calyx five-parted. *Corol* tubular. *Germ* semi-inferior, one-celled, many-seeded, attached to a free, inferior, central receptacle. *Berry* inferior, many-seeded.

1. B. *indica. R.*

Shrubby. *Leaves* alternate, ventricose-oblong, grossly serrate. *Racemes* axillary, and terminal; the terminal ones more generally compound.

A large shrub, a native of Chittagong; in the Botanic garden at Calcutta it flowers in February, March and April, but rarely perfects its seeds there.

It appears to differ from *Vahl's* B. *lanceolata. Symb.* i. *p.* 19. *t.* 6. in the leaves being I. 558 shorter-petioled, and more grossly serrate; as well as in the inflorescence.

Trunk erect, in plants eight or ten years old as thick as a man's leg. *Branches* numerous, extending down to the ground, straight and nearly erect. *Bark* smooth, dark brown, general height of the whole plant from eight to twelve feet. *Leaves* alternate, rather short-petioled, ventricose-oblong, tapering to an acute point, remotely and deeply repand, serrate, pretty smooth on both sides, and glossy on the upper surface, veins large and parallel, from three to six inches long, and from one to two and a half broad. *Stipules* none. *Racemes* axillary, and terminal, often several together, some of them ramous, much shorter than the leaves; the terminal one generally panicled. *Flowers* numerous, diverging, short-pedicelled, small, pure white. *Bractes* one at the base of each pedicel, and two pressing on the calyx. *Calyx* single, semi-supera, permanent, five-parted, divisions obtuse. *Corol* one-petalled. *Tube* short, somewhat gibbous. *Border* of five equal, roundish, expanded segments. *Filaments* short, inserted into the tube of the corol, immediately below the middle of the segments of the border, incurved, smooth. *Anthers* cordate, converging in form of a dome over the apex of the pistillum. *Germ* semi-inferior, broad-ovate, one-celled, containing numerous ovula from the bottom of the cell. *Style* short. *Stigma* tending to be lobate. *Berry* inferior, crowned with the permanent calyx, round, smooth, dry, size of a grain of black pepper, one-celled, evalvular. *Receptacle* round-cordate, free, attached to the bottom of the cell, as in *Primula*, &c. *Gært. sem.* i. 233. *t.* 50. *Seeds* numerous, angular.

2. B. *ramentacea. R.*

Shrubby. *Leaves* alternate, lanceolate, acuminate, entire, smooth. *Panicles* terminal,

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axillary, and lateral, ramentaceous. *Berries* minute, white, succulent.

Mulmooriya is the vernacular name at Silhet, where it is indigenous. It grows to be a pretty large shrub, blossoms in March and April, and the seeds ripen in October and November.

Leaves alternate, short-petioled, lanceolate, acuminate, entire, smooth, from two to six inches long. *Panicles* terminal, axillary, and lateral, numerous, small, crowded with small, abortive, ferruginous, ramentaceous branchlets. *Flowers* small, greenish-yellow. *Bractes* ferruginous, small, subulate. *Calyx* five-parted, almost five-leaved. *Corol ; tube* very small. *Border* of five orbicular, veined segments. *Filaments* five, short, inserted into the tube of the corol. *Anthers* two-lobed, broad-ovate. The *germ* may be called superior, ovate, smooth, one-celled ; *ovula* numerous, on a sub-cylindric receptacle, rising from the base of the cell. *Style* short. *Stigma* two or three-lobed. *Berries* completely inferior, size of a grain of black pepper, white, smooth, succulent, one-celled. *Cell* formed by a white, pretty hard, but thin, nuciform integument. *Seeds* several, minute, angular, black, pitted, attached to the free, central receptacle, as in the germ. *Integuments* uncertain, on account of the diminutive size of the seed. *Perisperm* soft, juicy, dark-coloured. *Embryo* sub-cylindric, transverse.

3. B. *nemoralis. Willd. spec.* i. 992.

Shrubby. *Leaves* alternate, ovate-oblong, repand-dentate, smooth. *Racemes* axillary, short, and crowded.

Mulmooriya is the vernacular name in Silhet, where it is indigenous and grows to the size of a pretty large, very ramous, upright shrub. It flowers in March, and the seeds ripen in May.

Branches and *branchlets* numerous, nearly erect, round and pretty smooth. *Bark* of the old woody parts brown, of the young shoots green. *Leaves* alternate, petioled, ovate-oblong, margins repand, serrate-dentate, (for there is a mixture of the whole,) in some acuminate, both sides smooth, texture firm, three or four inches long, by two broad. *Racemes* I. 560 axillary, about twice the length of the petioles, ramous, and crowded with minute white flowers. *Bractes* subulate, one-flowered, besides one or two broader on the short petioles, or pressing the calyx. *Calyx* campanulate, five-parted. *Corol* with a very short tube, and a border of five oval segments. *Filaments* five, inserted into the tube, under the middle of the segments of the border, short, incurved. *Germ* superior, one-celled, containing numerous ovula, attached to a free receptacle, rising from the bottom of the cell. *Style* short. *Stigma* three-lobed.

4. B. *glabra. R.*

Arboreous. *Leaves* alternate, ovate-lanceolate, entire, smooth. *Panicles* axillary, smooth.

A slender tree, with straight, smooth branches, and leaves ; a native of Chittagong, where it flowers in March.

5. B. *tetrandra. R.*

Leaves alternate, oblong, entire. *Racemes* axillary. *Flowers* tetrandrous.

A native of the Moluccas.

VERBASCUM. Schreb. gen. N. 331.

Corol rotate, somewhat unequal. *Capsules* superior, two-celled, two-valved.

1. V. *Thapsus. Willd. spec.* i. 1001.

Leaves decurrent, downy on both sides. *Stem* simple.

Found by Captain Hardwicke amongst the mountains on his tour to Shreenugura. In the Botanic garden at Calcutta it grows to the height of from six to eight feet, the stem still perfectly straight, but often ramous ; it blossoms during the cold season.

I. 561 *DATURA. Schreb. gen. N.* 332.

Corol infundibuliform, plaited. *Calyx* tubular, angular, deciduous. *Capsule* four-valved.

1. D. *fastuosa. Willd. spec.* i. 1008. *Fleming* in *Asiat. Res.* xi.

Annual, coloured. *Leaves* with the two sides unequally ovate, margins repand, lobate. *Flowers* double. *Fruit* round, echinate, drooping.

Beng. Kala-Dhootoora.

Stramonia indica tertia, seu *Datura rubra. Rumph. Amb.* x. 243. *t.* 87. *f.* 2.

A native of various parts of India. It flowers during the rainy and cool season. The dry root smoked is said to relieve spasmodic asthma.

2. D. *Metel. Willd. spec.* 1009. *Fleming. Ibid.* 165.

Annual. *Leaves* with the two sides unequally ovate, margins repand-lobate. *Fruit* round, spinous.

Beng. Dhootoora.

Stramonia indica prima, seu *Datura alba. Rumph. Amb.* v. 242. *t.* 87. *f.* 1.

Hummatu. *Rheed. Mal.* ii. 47. *t.* 28.

Very common every where over India; produces flowers and seed the whole year.

PHYSALIS. Schreb. gen. N. 336.

Calyx gibbous, five-toothed. *Corol* rotate. *Berry* superior, within the inflated calyx, two-celled, many-seeded.

1. P. *flexuosa. Willd. spec.* i. 1020.

Shrubby; *branches* flexuose. *Leaves* oblong, often paired. *Flowers* axillary, crowded, sessile.

Pevetti. *Rheed. Mal.* iv. 113. *t.* 55.

Beng. Ushwa-gundha.

Teling. Penneroo.

This perennial species is to be found in almost every soil and situation. Flowers all the year round.

Stems several, erect, shrubby, flexuose, two-forked, round, downy. *Leaves* double, short-petioled, ovate, a little scolloped, downy, from two to four inches long. *Flowers* axillary, sub-sessile, crowded, small, greenish. *Corol* campanulate. *Anthers* split at the base. *Berry* red, smooth, size of a pea.

The Telinga physicians reckon the roots alexipharmic; indeed they are all much addicted to the belief of such powers being present in a great variety of their simples; hence the name *Naga*, (*i. e.* the hooded snake, *Coluber Naga* of *Linnæus*) being so often annexed to that of various plants. They are as fond of the study of antidotes as the Greek or Roman physicians were, which will appear the less surprizing if we consider the great number of poisonous animals and plants which abound in the warmer part of Asia, to the dreadful effects of which they are very often eye-witnesses. It is therefore very natural for them to attend much more to this branch of medicine than is done in cold climates, where there is scarcely an animal of which the bite or sting can be said to be mortal.

2. P. *Alkekengi. Willd. spec.* i. 1022.

Herbaceous; *branches* straggling. *Leaves* in pairs, entire, and somewhat angular.

A native of Persia. In the Botanic garden at Calcutta it flowers during the cool season, but does not thrive in Bengal.

3. P. *peruviana. Willd. spec.* i. 1022.

Biennial or perennial, very ramous, diffuse, pubescent. *Leaves* double, or single, and then with a branchlet; cordate, dentate. *Flowers* solitary, drooping. *Stigma* two-cleft.

P. *edulis. Sims' Bot. Mag.* 1068. I concur with the author, in referring P. *pubescens* to the same species.

Beng. Tepuriya.

I have only found this in a cultivated state and that on account of its large, yellowish, palatable berries; although naturally perennial yet the plants are reared annually from seed, as they are not fruitful after the first year. The same is the case with the *Capsicums* and the many varieties of *Solanum Melongena.*

4. P. *minima. Willd. spec.* i. 1024.

Annual, ramous, downy. *Leaves* double or single, and then with a branchlet, ovate, irregularly dentate. *Flowers* solitary, erect. *Stigmas* entire. *Fruit* pendulous.

Inota-Inodien. *Rheed. Mal.* x. *ceu. Moetoe.* 139. *t.* 70.

Beng. Bun Tepuriya.

Hind. Toolati-pati.

A small ramous annual, common on cultivated ground, both in Bengal and on the coast of Coromandel.

Stem short, but distinct; *branches* many, two-forked, striated, a little downy. *Leaves* double, except at the divisions of the branchlets, where they are single, the smaller branchlets occupying the place of the other; unequal, petioled, cordate, irregularly toothed, downy on both sides; from two to four inches long. *Peduncles* solitary, axillary, erect, one-flowered. *Flowers* small, campanulate, uniform, pale yellow, and smooth. *Filaments* a little hairy, yellow.

SOLANUM. Schreb. gen. N. 337.

Calyx five-parted. *Corol* rotate. *Anthers* coalescent, gaping at the top with a double pore. *Berry* superior, two-celled, many-seeded.

SECT. I. *Unarmed.*

1. S. *pubescens. Willd. spec.* i. 1026.

Sub-arboreous, unarmed. *Leaves* alternate, oblong, pointed, entire, downy. *Cymes* dichotomous.

Gandira* the Sanscrit name, see *Asiat. Res.* iv. 258.

Beng. Urusa.

Teling. Rusa-ghedi maun.

Amongst the mountains in the Telinga country this grows to be a small or middle-sized tree, with a very thick shady head. Flowers during the hot season.

Leaves alternate, short-petioled, oblong, entire, downy, from six to ten inches long. *Cymes* terminal or leaf-opposed, two-cleft; *ramifications* recurved. *Flowers* small, white, very numerous. *Berry* the size of a cherry.

2. S. *auriculatum. Willd. spec.* i. 1025.

Sub-arboreous, every part downy. *Leaves* broad-lanceolate, entire. *Stipules* axillary, obliquely ovate-cordate. *Cymes* in the forks of the branchlets, dichotomous.

* This name probably belongs to some other species.—W. C.

Page Carey Ed. A native of Mauritius, and introduced by Captain Tennant, into the Botanic garden at Calcutta: where it blossoms during the rainy and cold seasons, and continues to ripen its fruit from December till May.

Stem nearly erect, in six years as thick as a man's leg, and about eight feet high. *Bark* smooth, ash-coloured. *Branches* dichotomous, spreading much. *Branchlets* and all the tender parts most completely clothed with sessile and pedicelled, hoary, stellate pubescence. *Leaves* alternate, petioled, broad-lanceolar, tapering to a rather obtuse point, entire: clothed underneath like the branchlets: upper surface a little hairy; from four to eight inches long, and two or three broad. *Petioles* channelled, downy like the branchlets. *Stipules* in sessile, axillary pairs, obliquely ovate-cordate, large, and recurvate round the branchlets, looking more like small common leaves than stipules. *Cymes* in the forks of the branchlets long-peduncled, dichotomous. *Ramifications* recurvate, sub-secund. *Flowers* numerous, sub-sessile, small, lively blue-purple. *Berry* spherical, size of a small cherry, when ripe of a dull yellow.

I. 565

Obs. Independently of the colour of the flowers, the stipulæ or axillary leaves render this species readily known; in all other respects it almost exactly resembles the preceding; in that plant there are no stipulæ, and the flowers are white.

3. S. *Lycopersicum. Willd. sp.* i. 1033.

Annual. *Leaves* pinnate, gashed. *Racemes* bipartite, leafless. *Fruit* smooth, vertically compressed, torulose.

Pomum amoris. *Rumph. Amb.* v. *t.* 154. *f.* 1.

Although this is now very common in India, I suspect it is as little a native as the common potatoe, which is now very generally cultivated over India, even by the natives for their own use.

4. S. *rubrum. Willd. sp.* i. 1034.

Annual, erect, unarmed. *Branches* somewhat angular. *Leaves* ovate, dentate, lobate. *Umbels* short-peduncled. *Flowers* and *berries* drooping.

Beng. Goorkhi.

Nelen tsjunda. *Rheed. Mal.* x. *t.* 73.

A common weed in gardens all over India, with flowers and ripe seed the whole year round.

Seeds received from the Mauritius under the name of *Solanum nodiflorum, (Willd. sp.* i. 1035.) produced this very plant. On that Island it is called *Brede*, and very generally cultivated as a pot herb.

5. S. *decemdentatum. R.*

Annual, erect, ramous, hairy. *Leaves* in pairs or solitary with a branchlet, ovate. *Peduncles* axillary, from two to six together, one-flowered. *Calyx* ten-toothed.

I. 566

A native of China; from thence introduced into the Botanic garden at Calcutta, where it blossoms and ripens its berries most part of the year.

It has the habit of a robust, pubescent variety of *Solanum nigrum.*

Stems annual, nearly erect, with alternate, flexuose, pubescent, round branches and branchlets; general height two or three feet. *Leaves* in pairs or single, and accompanied with a branchlet, petioled, ovate-oblong, somewhat acute, villous. *Peduncles* axillary, from two to six together, one-flowered, drooping when in blossoms. *Calyx* ten-toothed, pubescent. *Berries* the size of a pea, smooth, bright red, when ripe.

6. S. *spirale. R.*

Shrubby, void of pubescence. *Leaves* paired, lanceolar, entire. *Racemes* lateral, the unexpanded part spirally revolute. *Segments* of the calyx glandular.

Bugua is the vernacular name in Silhet, where it is indigenous, and in flower and fruit at various times of the year. Though rather fœtid it is an ornamental species on account of its smooth, deep green leaves; spiral racemes of pretty white flowers; and numerous small, round yellow berries.

SECT. II. *Armed.*

7. S. *Melongena. Willd. sp.* i. 1036.

Perennial. *Leaves* obliquely-ovate, downy, scollop-lobed. Fertile *flowers* solitary, long peduncled, drooping; the barren ones on small racemes. *Fruit* oval, smooth.

Beng. Begoon.

Hind. Bangan.

Teling. Wangkai.

Nila-Barudeua. *Rheed. Mal.* x 147. *t.* 74.

Trongum hortense. *Rumph. Amb.* v. 238. *t.* 85.

I. 567

Of this very universally useful, esculent species, there are many varieties cultivated in India. The plants are annually renewed from seed, though all the varieties are perennial; but like the *Capsicums* not so productive after the first year. They continue to blossom and bear fruit the whole year, but chiefly during the cold season. In Bengal, in a rich soil, they have very few prickles, but in a poor one many.

8. S. *longum. R.*

Perennial. *Leaves* irregularly ovate, scolloped. *Fruit* cylindrical, smooth. *Calyx* sometimes armed.

Sans. Koolee.

Beng. Kooli-begoon.

Neer Wanga is the Telinga name of the plant, and Neer Wangkai the fruit.

Long Brinjal of Europeans.

Page Carey Ed.

I consider this to be a species clearly distinct from *melongena*, for the fruit is always cylindrical, never changing by culture into any other form. The plant is biennial, and in every respect like *Melongena*, the fruit excepted. I have only met with it in gardens, where it is cultivated for the table, and have had it nine years in mine without producing any change in it. The cold season is the proper time for rearing it.

The plants will exist several years, but are either dug up or neglected after the first.

Stem short, erect, somewhat woody. *Branches* numerous, spreading, two-forked, downy, sometimes prickly; the whole plant is from two to three feet high. *Leaves* alternate petioled, oblong, scolloped, or sub-lobate, downy; from six to ten inches long; sometimes the principal nerve is prickly on the under side. *Flowers* bowing, large, of a beautiful, bright bluish-purple, they are of two kinds, abortive with a minute pistil on a small raceme or umbellet; and a single fertile one upon its own proper petiole, which generally stands immediately below or close by the peduncle of the racemes. *Calyx* and *petioles* sometimes prickly. *Berry* pendulous, cylindric, generally a little curved, but never in the least clubbed, smooth, yellow; from nine to eighteen inches long, and from one and a half to two and a half in diameter, it is generally three-celled.

I. 568

9. S. *insanum. Willd. sp.* i. 1037.

Perennial, (in a poor soil) armed. *Leaves* ovate, sinuate, downy. *Peduncles* from one to four-flowered. *Calyx* often armed. *Fruit* from oval to spherical, polished.

A native of Amboyna, yet I doubt whether Rumphius's *Trongum hortensi* can be any other than the real Indian *melongena*. From the same Island, the seeds of a variety of the above (*insanum*), were brought to the Botanic garden at Calcutta. Their plants are more spinous, and the fruit perfectly round, white, and smooth, almost the size of a small *Crab-apple*. This I take to be Rumphius's *Trongum agreste, vol.* v. *p.* 249. *t.* 86. *f.* 1. and so far as my observation extends, it is not cultivated on the continent of India.

10. S. *æthiopicum. Willd. sp.* i. 1036.

Annual, scarcely armed. *Leaves* oval, repand, downy. *Peduncles* one-flowered. *Berries* red, smooth, depressed, five-lobed.

From the Mauritius, where it is said to be indigenous, it has been introduced into the Botanic garden at Calcutta, where it grows to the height of about two feet, with many spreading branches, clothed with short stellate pubescence, and here and there a small straight prickle; flowers white, and appear at all season.

11. S. *diffusum. R.*

Diffuse, perennial, prickly. *Leaves* oval, deeply scolloped, downy and prickly on both sides. *Peduncles* and *calyces* prickly. *Berries* round.

Solanum incanum chinense. *Pluck. Alm.* 62. *f.* 1.

I. 569

Sans. Surputunoo, Kshurika, Peetutundoola, Pootruprada, Buhoophula, Godhinee, Kuputeshwuree, Kinna, Kutoovarttakee, Kshetruja.

Teling. Nella Mollunga.

This is by far the most common species I know; every soil and situation seems to suit it equally well; it is in flower all the year round, and often perennial.

Stem none, but numerous, irregular, woody, diffuse, two-forked branches spread on the ground, or near it; *young shoots* covered with stellate down; all the branches thickly armed with strong, sharp, compressed, somewhat recurved pricklets. *Leaves* alternate, petioled, oval, much scolloped, or slightly lobate; both sides covered with stellate down, and the veins armed with straight prickles. *Flowers* as in S. *longum*, except that here the raceme is sometimes wanting. *Berry* perfectly globular, smooth, about an inch in diameter, colour varying according as they have been exposed to the sun, or sheltered; in the former case they are yellow, in the latter white; the Telinga people give the name of *nella mollunga* to the former, and *tella mollunga* to the latter.

Obs. The fruits are much esteemed by the natives; all tribes eat them freely in their curries, for which reason the plant is often found cultivated in the Circars.

There is another sort, so exceedingly like this in almost every respect, that it was long before I discovered they were distinct: the chief distinguishing marks are, the leaves in this are longer, smoother, and deeply lobated, with the lobes sometimes scolloped, or sub-lobate, and the prickles much more numerous, longer, sharper and all perfectly straight.

12. S. *Jacquini. Willd. sp.* i. 1041.

Biennial, armed, angular, creeping. *Leaves* oblong-laciniate, armed on the sides with straight spines. *Calyx* armed. *Berries* globular, smooth, variegated.

Beng. Kanthakaree.

I. 570

A native of Bengal, where it is generally found on road sides near villages. It is in blossom, and produces ripe fruit most part of the year.

Root at least biennial. *Stem* none, but several, flexuose, ramous branches, spreading close on the ground, for an extent of some feet, often striking root at the insertion of the leaves; angular, nearly void of pubescence. *Leaves* frequently in pairs, oblong, pinnatifid, or laciniate, smooth, but armed on both sides with long, strong, straight spines. *Racemes* between the leaves, and almost as long, bearing four, five, or six alternate, pedicelled, large, bright blue flowers. *Calyx* armed with straight spines. *Berries* spherical, size of a large gooseberry, very smooth, drooping, while immature variegated with green and white, when ripe with different shades of yellow only.

13. S. *indicum. Willd. sp.* i. 1042.

Shrubby, armed, very ramous. *Leaves* ovate, lobate, downy, armed on both sides.

Page Carey Ed. *Racemes* leaf-opposed. *Calyx* armed. *Berries* erect, round, smooth.

Beng. Vyakool, Vyakoor, Goorkamai.

Cheru-chunda. *Rheed. Mal.* ii. *t.* 36.

Solanum fructescens, &c. *Burm. Zeyl. p.* 220. *t.* 102, is a pretty good representation of this plant, but I think Dillenius's S. *indicum spinosum flore boragineo, t.* 270. *f.* 349. must have been taken from a very different species, the flowers being much too large, and the leaves too deeply divided for our East Indian plant.

Trunk trifling, but the branches are numerous, ligneous, and perennial, forming a large, very ramous shrub of several feet in height, armed with numerous very acute, somewhat recurved spines; the young parts are downy. *Leaves* solitary, or in pairs, petioled, ovate-lobate, downy, and armed with a few straight spines on both sides, from two to four inches long. *Racemes* between or opposite to the leaves, supporting several long-pedicelled, middle-
I. sized, pale blue flowers. *Calyx* deeply five-cleft, armed. *Berries* erect, round, smooth, size
571 of a marrowfat pea: while immature, variegated with deeper and lighter green, when ripe with deep orange yellow.

14. S. *trilobatum. Willd. sp.* i. 1049.

Shrubby, scandent, armed with recurved, acute prickles. *Leaves* ovate, three, four, or five-lobed, smooth. *Racemes* terminal, or between the leaves. *Berries* drooping, round, smooth.

Teling. Oochinta-kura; kura means esculent, the leaves being one of their favourite pot herbs.

Solanum *trilobatum. Burm. Ind.* 55. *t.* 22. *f.* 2.

Compare with Lamark's S. *acetosifolium.*

A native of the coast of Coromandel, particularly the Northern Circars, where it is found in abundance on the road sides, running over bushes, upon low trees, or whatever support it meets; for it is by far too long and slender to support itself. In flower and seed the whole year.

Stems and larger *branches* ligneous, scandent; armed with numerous, very sharp, recurved prickles, otherwise perfectly smooth; general extent from one to two fathoms, and often very ramous. *Leaves* scattered, remote, petioled, sub-ovate, three, four, or five-lobed, smooth, of a shining green on both sides. *Petioles* and *veins* armed. *Peduncles* leaf-opposite, solitary, or accompanied with a single, one-flowered pedicel; armed, few-flowered. *Flowers* large, bluish-purple. *Germ* two-celled. *Berries* of the size and appearance of a red currant, smooth, drooping.

15. S. *hirsutum. R.*

Annual or biennial, ramous, prickly, and hairy. *Leaves* double, one of the pair smaller, ovate-cordate, angle-lobed. *Calyx* unarmed. *Berry* round, very hairy, four-celled.

Ana-Chunda. Rheed. Mal. ii. 65. *tab.* 35.

I. *Beng.* Ram-begoon.
572 Is a scarce plant, grows in the country about Calcutta, and is found in flower and fruit in August.

Root perennial. *Stem* scarcely any, but many sub-ligneous branches covered with much down, and armed with innumerable, small, erect spines. *Leaves* double, as in several of the *Physali;* petioled, one of the pair always much larger than the other, but it is from the axills of the smallest that the branchlets issue; they are obcordate, irregularly angle-lobed; the upper surface is thickly covered with much erect, soft hair, on the under side it is more distinctly stellate, and whitish; *nerve* and larger *veins* armed on both sides with strong straight prickles, the largest from six to nine inches long, and from four to six broad, the smaller about half the size. *Petioles* round, hairy, prickly; those of the large leaves half their length, and coloured on the upper side; those of the smaller ones about one-fourth part of their length. *Umbel* generally opposite, and below the leaves, simple, few-flowered. *Peduncles* and *pedicels* short and hairy, but not prickly. *Flowers* white, pretty large. *Calyx* hairy, otherwise unarmed. *Corol* very hairy on the outside. *Anthers* sessile, conical. *Germ* hairy. *Berries* the size of a nutmeg, round, very hairy, four-celled, as in *Datura.*

16. S. *stramonifolium. Jacqu.*

Shrubby, erect. *Branches, petioles* and *leaves* sparingly beset with strong, flattened prickles. *Leaves* alternate or geminate, ovate, unequally cordate, deeply sinuate-lobate, with stellate pubescence on both sides. *Corymbs* lateral, bifid, unarmed, with glandular, slightly viscous pubescence. *Corolla* flat, with undulate laciniæ. *Berry* round, smooth; on thickened, clavate *peduncles.*

Beng. Gota begoon.

This is an exceedingly common plant in Bengal, where it grows near the habitations of men; in blossom and fruit the whole year.

I. 573

CAPSICUM. Schreb. gen. N. 338.

Corol wheel-shaped. *Anthers* converging. *Berry* superior, juiceless, from two to three-celled.

1. C. *purpureum. R.*

Shrubby. *Leaves* ovate-lanceolate. *Peduncles* solitary in the divisions of the branchlets; after the blossom drops erect. *Berry* erect, ovate, dark purple.

In 1796, I found a single plant of this species in the garden, but from whence it came I could never learn; most likely from the Molucca Islands. The seeds have for these thirteen years continued to produce, in all situations, plants exactly the same as the original one;

this circumstance, with the general colour and erect ovate fruit, leaves little room to doubt its being a distinct species. Pag Carey Ed.

Stem short, branches numerous, dichotomous; *young shoots* almost four-sided, and deeply tinged with dark purple; whole height from two to four feet. *Leaves* solitary at the divisions of the branches, or in pairs where the branches do not divide, petioled, ovate-lanceolate; they are also tinged with the prevailing dark purple colour of the whole plant, particularly the nerves and veins. *Peduncles* solitary in the divisions of the branches, as long as the petioles. *Flowers* a beutiful purple, drooping. *Berry* ovate, erect, of a dark-purple till ripe, then of a dull reddish colour, generally three-celled, but the partitions are often discontinued towards the apex.

The envelope of the seed is rather less acrid than that of the other sorts in use at our tables.

2. C. *annuum. Willd. sp.* i. 1050.

Shrubby. *Leaves* ovate-lanceolate. *Peduncles* solitary. *Flowers* drooping. *Fruit* oblong, reflex.

This does not appear to be a native of India, as the Hindoos have no name for it, nor is it even found in their gardens. In India the *Capsicums* are all shrubby, but produce so badly after the first year, and begin to look so scraggy, that they are seldom suffered to remain longer than one season. I. 574

3. C. *grossum. Willd. sp.* i. 1051.

Shrubby. *Leaves* ovate-oblong. *Peduncles* solitary, one-flowered, drooping. *Fruit* reflex, swelled into various shapes.

Beng. Kaffree-murich.

Caffree-chilly is the name by which this sort is generally known amongst Europeans; the plant does not appear to me to be a native of India. The thick fleshy skin of this species is but triflingly acrid, and a palatable condiment is made of them.

4. C. *frutescens. Willd. sp.* i. 1051.

Shrubby. *Leaves* ovate-lanceolate. *Peduncles* solitary. *Flowers* drooping. *Fruit* tapering, curved, reflex.

Beng. Lal gachh Lunka murich, or Lal Lunka murich.

Hind. Lal gachh murich.

There is a pointed variety, with the fruit yellow, or of a bright orange colour when ripe, which the Hindoos call simply *gachh murich*, it is the sort most used; particularly when dried, in which state it is to be found in every market.

5. C. *minimum. R.*

Shrubby. *Leaves* ovate-cordate. *Peduncles* in pairs. *Flowers* drooping. *Calyces* with subulate, spreading teeth. *Fruit* sub-cylindric, erect.

Beng. Dhan Lunka murich.

East Indian Bird chilly or *Cayenne-pepper capsicum.*

6. C. *cerasiforme. Willd. spec.* i. 1051.

Shrubby, fruit globular.

I doubt much whether this be a native of India, for I have only found it in the gardens of the curious.

STRYCHNOS. Schreb. gen. N. 339. I. 575

Calyx five-parted. *Corol* funnel-shaped. *Germ* two-celled; *ovula* many, attached to the middle of the partition. *Berry* superior, one-celled. *Seeds* nestling in soft pulp. *Embryo* furnished with a perisperm, and the radicle pointing to the receptacle, now obliterated (centripetal.)

1. *S. Nux-vomica. Willd. sp.* i. 1052. *Roxb. Corom.* i. 4.

Leaves opposite, three and five-nerved, oval, lucid. *Berries* many-seeded.

Cariram. *Rheed. Mal.* i. *t.* 37.

Beng. Koochila.

Teling. Musadi.

A middling-sized tree, common on almost every part of the coast of Coromandel; in flower during the cold season.

Trunk short, often crooked, but pretty thick. *Branches* irregular, both are covered with smooth, ash-coloured bark: *young shoots* highly polished, deep green. Wood white, hard, close-grained, and bitter. *Leaves* opposite, short-petioled, oval, shining, smooth on both sides, entire, from three to five-nerved, or rather between that and triple, or quintuple, differing in size from one and a half to four inches long, and from one to three broad. *Stipules* none. *Flowers* small, greenish-white, collected on small, terminal corymbs. *Calyx* five-toothed, permanent. *Corol* infundibuliform, as in the genus. *Filaments* scarcely any, or exceedingly short, inserted over the bottom of the divisions of the corol. *Anthers* oblong, half within the tube, and half out. *Germ* two-celled, with many ovula in each, attached to the thickened centre of the partition. *Style* the length of the tube of the corol. *Stigma* capitate. *Berry* round, smooth, size of a pretty large apple, covered with a smooth, somewhat hard shell, of a rich, beautiful orange colour when ripe; filled with a white, soft, gelatinous pulp. *Seeds* several, immersed in the pulp of the berry.

The wood of this tree being hard and durable is used for many purposes by the natives. It is exceedingly bitter, particularly that of the root, which is used to cure intermitting fevers, and the bites of venomous snakes; when that of *Naga musadi* cannot be had. The I. 576

Pasu Curry Ind. seeds are employed in the distillation of country spirits, to render them more intoxicating. The pulp of the fruit seems perfectly innocent, as it is greedily eaten by many sorts of birds.

2. *S. potatorum. Willd. sp.* i. 1052. *Corom. pl.* t. X. 5.

Leaves opposite, from ovate to oval, smooth, pointed. *Bark* deeply cracked. *Berries* one-seeded.

Beng. and *Hind.* Nirmulee.

S. potatorum. Asiat. Res. xi. *p.* 178.

Teling. Indaga.

Tam. Tettan-kotta.

Eng. Clearing-nut.

This species grows to be a larger tree than *Nux-vomica*. It is much scarcer, being only found amongst mountains and woods of great extent. It flowers during the hot season.

Dr. König's description of this tree in the *supplementum plantarum* of Linnæus, page 148, is so [illegible] as to [illegible] the only [illegible] I have to [illegible] is that the leaves cannot be said to be either three or five-nerved.

Stipules entire, connecting. *Corymbs* from the extremities of the last year's shoots, round the base of this year's, small, bearing in ternary order, many small, erect, fragrant, greenish-yellow flowers. *Filaments* rather longer than in *Nux-vomica*. *Germ* and contents as in *S. Nux-vomica*. *Berry* shining, black when ripe.

The wood of this, like that of the former, is hard and durable, and is used for various economical purposes.

The pulp of the fruit, when ripe, is eaten by the natives; to me the taste is rather disagreeable.

1 577 The ripe seeds are dried, and sold in every market to clear muddy water. The natives never drink clear well water if they can get pond or river water, which is always more or less impure according to circumstances. One of the seeds is well rubbed for a minute or two round the inside of the vessel containing the water, generally an unglazed earthen one, which is then left to settle: in a very short time the impurities fall to the bottom, leaving the water clear and, so far as I have been able to learn, perfectly wholesome. These seeds are constantly carried about by the more provident part of our officers and soldiers, in time of war, to enable them to purify their water. They are easier to be procured than alum, and are probably less hurtful to the constitution.

3. *S. colubrina.* Willd. sp.* i. 1052.

Scandent; *tendrils* simple. *Leaves* from oval to oblong, obtusely acuminate, triple-nerved, polished. *Berries* many-seeded.

1 578 *Modoo* Caneram. *Rheed. Mal.* 8. *t.* 24.

Beng. Koochila-luta.

Found by Mr. M. R. Smith, indigenous on the hills near Silhet, where it blossoms in April, and the seeds ripen in September and October.

Stem of great size, often from eight to twelve inches in diameter; the wood hard, intensely bitter and of a light gray colour; this with its numerous ramifications climbs over the highest trees. *Bark* ash-coloured, more or less scabrous, according to the age and size of the part of the young shoots, smooth and green. *Tendrils* lateral, simple, becoming thick and ligneous. *Leaves* opposite, short-petioled, from oval to oblong, entire, obtusely acuminate, triple-nerved; *nerves* extending to the apex, texture rather thin; glossy; from three to six inches long, by two or three broad. *Stipules* none. *Corymbs* terminal, small; composed of two or three pairs of opposite, few-flowered, short, villous branches. *Flowers* small, greenish yellow, in a sub-ternary order. *Bractes* one under each division and sub-division of the corymb, tapering, villous. *Calyx* five-parted, clammy, with glandular pubescence. *Corol* infundibuliform, smooth. *Tube* cylindric. *Border* five-parted: *segments* linear-oblong, spreading. *Filaments* five, short, inserted into the mouth of the tube of the corol under the [illegible] of its border. *Anthers* [illegible] with many [illegible] in each, attached to a fleshy ridge down the middle of the [illegible]. *Germ* the length

1 579 of the corol. *Stigma* capitate. *Berry* often as large as an orange, round, in the advanced state one cell only can be detected. *Cortex* rather hard and brittle: colour from a bright yellow to a dirty looking mixture of yellow and rough brown. *Pulp* gelatinous and yellow. *Seeds* from two to twelve, orbicular, much flattened as in the *Nux-vomica*, peltate, nearly an inch broad. *Integuments* two: the *exterior* one thin, but tough, and most densely clothed with soft, short hairs, like the softest velvet: the *interior* one a very thin brown membrane.

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* The [illegible] [illegible] [illegible]

Perisperm conform to the seed, united round the margins, the middle free, resembling two cotyledons, horny. *Embryo* straight, much smaller than the perisperm, and lodged close to the umbilicus, which may be readily known by the hair being longer at that part, forming a tuft round it. *Cotyledons* cordate, three-nerved. *Radicle* oval, pointing to the umbilicus, (centripetal.)

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SERISSA. Juss.

Corol one-petalled, funnel-shaped; *throat* ciliate; *segments* of the border sub-tri-lobate. *Berry* inferior, two-seeded.

1. *S. fœtida. Willd. sp.* i. 1061.
Lygoda faxiculata. Lamiero Cochin Ch. 181.
Lycium japonicum. Thunb. Jap. 93. *t.* 17.
Lycium fœtidum, Linn. suppl. 150.
Lycium indicum. Retz. Obs. ii. *p.* 12.

Introduced into our gardens in India from China, which accounts for the natives having no name for it. In the Botanic garden at Calcutta it blossoms the whole year round, but never produces fruit; the flowers being constantly double.

ARDISIA. Schreb. gen. N. 1735.

Calyx five-leaved. *Corol* hypocrateriform. *Germ* superior, one-celled, one-seeded; *attachment* inferior. *Stigma* subulate. *Berry* superior, one-seeded. *Embryo* transversely serpentine in an ample perisperm.

I. 580

1. *A. solanacea. Willd. sp.* i. 1063. *Roxb. Coron.* i. 27.

Shrubby. *Leaves* alternate, oblong, entire, glossy. *Racemes* axillary, corymbiform. *Segments* of the corol ovate.

Beng. Bun-jam.
Teling. Conda-mayoor.

A small tree, or large shrub, a native of moist places in the vallies amongst the Circar mountains. In flower and seed nearly the whole year.

Trunk one or more from the same root, erect. *Bark* ash-coloured. *Leaves* alternate, [illegible], oblong, and cuneate-oblong, pointed, entire, smooth, glossy, somewhat succulent; from four to six inches long, by two or three broad. *Racemes* corymbiform, axillary, shorter than the leaves. *Peduncles* round, smooth. *Pedicels* clubbed, round, smooth. *Bractes* a concave one below each pedicel. *Flowers* pretty large, rose-coloured. *Calyx* five-leaved; *leaflets* imbricated, concave, roundish; permanent. *Corol* one-petalled. *Tube* [illegible] short. *Border* five-cleft; *divisions* spreading, ovate. *Filaments* five, exceedingly short, from the bottom of the tube. *Anthers* oblong, acute. *Germ* superior, oblong. *Style* awled. *Stigma* acute. *Berry* size of a small cherry, round, juicy, black, one-seeded.

The juice of the berries is of a very beautiful bright red colour; upon paper it changes to a durable brown.

2. A. *paniculata. R.*

Shrubby. *Leaves* [illegible]-oblong, wedge-shaped, entire, smooth, reflex. *Panicles* terminal, oval, composed of many alternate, compound branches.

A large shrub, or small tree, a native of the hilly parts of Chittagong, and particularly conspicuous on account of its large reflexed leaves, (from six to twelve inches long;) and very large, oval panicles of numerous, fleshy rose-coloured flowers. Like most of the other species, it continues to blossom and ripen its seed most part of the year.

I. 581

Young shoots thick, somewhat succulent, with smooth, clear, green bark. *Leaves* crowded about the ends of the branchlets, sub-sessile, from lanceolar to cuneate-oblong, rather obtuse, entire, smooth, from six to twelve inches long, and from three to five broad. *Panicles* terminal, very large, oval; composed of numerous, patent, compound branches, all are round, smooth and green. *Flowers* very numerous, pretty large, rose-coloured. *Bractes* oblong. *Calyx* the border divided into five broad-ovate segments. *Corol* sub-rotate; *segments* of the border ovate. *Filaments* five, short, inserted into the base of the corol. *Anthers* sagittate, united into a cone. *Germ* ovate, one-celled, containing one *ovulum* attached to the bottom of the cell. *Style* longer than the stamina. *Stigma* simple.

3. A. *colorata. R.*

Shrubby. *Leaves* [illegible]-lanceolar, acute, smooth; *veins* nearly diverging. *Panicles* terminal, large and [illegible]; composed of a few, decompound, expanding branches.

Umur-kulli, the vernacular name at Silhet, where the shrub is indigenous, and one of the most desirable species of the genus I have yet met with. It is in flower and seed the greatest part of the year.

Trunk erect, with numerous, smooth, expanding branches and branchlets; general height, in its native soil, about twelve feet. *Leaves* alternate, short-petioled, linear-lanceolar, acute, veins parallel and nearly diverging from the rib, [illegible] long, and about two broad. *Floral* leaves minute. *Panicles* terminal, solitary, very large; composed of several large, compound and decompound branches; all of which with their subdivisions are smooth, and of a pretty deep bright red colour. *Bractes* lanceolate. *Calyx*, *corol*, &c. as in the family. *Berries* somewhat oblate, smooth, succulent, red, size of a pea. *Seed* solitary, of a deep yellow in the base. *Perisperm* conform to the seed, very hard, some small [illegible]-coloured specks on the outer surface, in some places resembling a little [illegible] *Embryo* [illegible], serpentine, &c. as in Gærtner's *Anguillaria*, i. 372. *t.* 77.

I. 582

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4. A. *umbellata. R.*

Shrubby, erect. *Leaves* short-petioled, oblong, smooth, veinless, entire. *Umbels* axillary, drooping. *Calyx* five-parted. *Berries* vertically compressed.

A native of Sumatra, from thence Dr. Charles Campbell sent the seeds to this garden, where the plants thrive luxuriantly, and blossom most part of the year.

Stem shrubby, erect, with alternate, ascending branches; all are covered with a smooth bark; general height of the full grown shrubs about eight feet. *Leaves* alternate, short-petioled, oblong, entire, polished on both sides, deep green, and almost destitute of veins; length from three to four inches, and about two broad. *Peduncles* axillary, solitary, shorter than the leaves, bearing in a simple umbellet, many pretty large, drooping, rose-coloured flowers. *Calyx* five-parted; *divisions* short, and rounded. *Corol. Tube* very short; divisions of the border lanceolate, first recurved, then revolute. *Filaments* short, inserted on the mouth of the tube of the coral. *Anthers* united by their heads into a cone. *Germ* superior, round. *Style* tapering. *Stigma* simple, appearing without the points of the anthers. *Berry* depressed, smooth, shining black, size of a large pea, succulent; the pulp being in considerable proportion, and replete with purple juice. *Seed* solitary, round. *Perisperm* and *embryo* as in the other species.

5. A. *villosa. R.*

Shrubby, erect, with spreading, villous branchlets. *Leaves* lanceolate, crenulate, villous underneath. *Umbellets* terminal, compound, hairy.

A native of the forests of Pulo Pinang, where Mr. R. found it in blossom in July. Com-
I. pare with *Pyrgus racemosa, Lourier. Cochin Ch.* 149.
583

6. A. *lanceolata. R.*

Shrubby, with diverging branches. *Leaves* broad-lanceolar, polished. *Panicles* terminal, axillary, composed of a few simple racemes.

A native of the forests of Pulo Pinang, where Mr. W. Roxburgh found it in blossom in July.

Leaves alternate, short-petioled, broad-lanceolar, acuminate, smooth, entire; from six to nine inches long, and two or three broad. *Panicles* terminal and axillary, shorter than the leaves, composed of a few diverging branches. *Flowers* numerous, pedicelled, of a middling size, diverging. *Bractes* solitary, under each pedicel, lanceolate. *Calyx* deeply divided into five ovate segments. *Corol* rotate; *segments* five, ovate-acuminate. *Anthers* sub-sessile, sagittate, open near the acute apex on the inside. *Germ* ovate, one-celled, containing one *ovulum* attached to the bottom of the cell. *Style* length of the stamina. *Stigma* simple, acute.

7. A. *divergens. R.*

Shrubby, with diverging branchlets. *Leaves* sub-sessile, lanceolate, smooth, entire. *Umbellets* terminal, sessile.

A native of the Moluccas.

8. A. *crenata. R.*

Leaves lanceolate, crenate. *Racemes* terminal, often compound. *Flowers* drooping.

From Pulo Pinang, where it is a native.

Shrubby, erect. *Leaves* short-petioled, alternate, lanceolate, margins smooth, somewhat obtuse, crenate. *Racemes* generally solitary, from the extremities of the corymbiform lateral branchlets, and always accompanied with a leaf or two, sometimes they are proliferous. *Flowers* numerous, small, drooping. *Calyx, corol, stamens* and *pistillum* as in A. *solanacea. Berry*
I. globular, smooth, size of a pea, one-seeded.
584

9. A. *glandulosa. R.*

Shrubby. *Leaves* lanceolar, margins coloured and glandular. *Umbellets* sub-terminal, numerous, long-peduncled, globular.

Bun-nurukalee the vernacular name in Silhet, where the shrub is indigenous, flowering in the rainy season.

Leaves alternate, short-petioled, lanceolar, smooth, margins coloured, somewhat repand, and strongly marked with little, elevated, dark-coloured glands on and rather under the margin; from four to six inches long, and an inch or an inch and half broad. *Umbellets* generally from four to eight, alternate at and round the extremities of the numerous smooth branchlets, long-peduncled, few-flowered, and globular. *Flowers* small, white, short-pedicelled. *Calyx* five-parted, marked with ferruginous spots. *Corol* alternate, the tube being very short; segments of the border five, round, emarginate; imbricated in the bud. *Filaments* inserted on the base of the tube. *Anthers* large, sub-sagittate, sides firmly united, forming a little dome over the mouth of the tube. *Germ* ovate, one-celled, and containing one ovulum, attached to the bottom of the cell. *Style* slender. *Stigma* rather enlarged, and even with the top of the anthers.

CHIRONIA. Schreb. gen. N. 349.

Corol rotate. *Pistil* declined. *Stamina* inserted on the tube of the corol. *Anthers* at last spiral. *Pericarp* two-valved, one-celled. *Seeds* numerous.

1. C. *centaureoides. R.*

Annual, erect, four-sided, first brachiate, afterwards dichotomous. *Leaflets* of the calyx keeled and acute. *Leaves* sessile, from oblong to linear, sub-tri-nerved. *Stigma* two-lobed.

Chironia *carinata, Herb. Banks,*

Beng. Girmi.

A native of Bengal, appears during the end of the cold, and beginning of the hot season. 585

Stems erect, four-sided, often very ramous, smooth, from three to twelve inches high; below brachiate, dichotomous, with a flower in the fork. *Leaves* opposite, sessile; the lowermost from oval to oblong, and three-nerved, the superior linear, and half stem-clasping; all are smooth, and entire; about an inch long. *Flowers* long-peduncled, solitary in the divisions of the branches and two or three-fold at their terminations. *Calyx* nearly as long as the tube of the corol, five-cleft to the base; *divisions* keeled and acute. *Corol* and *stamens* as in the genus, the anthers becoming much twisted. *Germ* oblong. *Stigma* of two large, round plates, each surrounded with a thick, glandular, pubescent, horse-shoe-like margin. *Capsules* oblong, one-celled, two-valved. *Seeds* numerous, affixed to two longitudinal receptacles as in *Gentiana*.

Obs. I attend to the spirally twisted anthers, otherwise I should from the structure of the capsules and two-lobed stigma have considered it a *gentiana*. The fresh plant is considerably bitter, consequently when dry much more so. In the *Banksian Herbarium* I found specimens both of this and C. *carinata* under my name.

ERYCIBE. Roxb.

Calyx five-toothed. *Corol* one-petalled; *border* ten-parted. *Germ* superior, one-celled, from three to four-seeded, attached to the bottom of the cell. *Berry* one-seeded.

1. E. *paniculata. Roxb. Corom.* ii. 159.

Erimia-Tali. *Rheed. Mal.* vii. 73. *t.* 39.

A very large, climbing shrub; a native of the mountain forests, the Circars, and the eastern border of Bengal; *young shoots* covered with much rust-coloured farina. *Leaves* I. alternate, short-petioled, reflexed, linear, oblong, pointed, entire, smooth, from four to five 586 inches long, and about two broad. *Panicles* terminal, large, oblong, covered with some rust-coloured farina. *Flowers* numerous, small, rust-coloured; border yellow. The ten divisions of the border of the corol unequal and orbicular. *Filaments* from the base of the tube of the corol, short. *Anthers* ovate, pointed. *Germ* superior, round, smooth, one-celled, containing three, four, or five *ovula*, attached to the bottom of the cell. *Style* scarcely any. *Stigma* large, five-grooved. *Berry* the size of a small cherry, black, pulpy, one-seeded.

EMBELIA. Jus.

Calyx five-parted. *Corol* five-petalled, on which the stamina are inserted. *Germ* superior, one-seeded; *attachment* inferior. *Drupe* one-seeded. *Embryo* transversely serpentine, and furnished with a perisperm.

1. E. *Ribes. Burm. Ind.* 62. *t.* 23.

Shrubby, scandent. *Leaves* alternate, petioled, oblong, entire, smooth. *Panicles* terminal, hairy.

Ribesioides. *Linn. fl. zeyl. N.* 403.

Baberung, the vernacular name in the Silhet district.

An immense climber, a native of the forests on the east border of Bengal, where it blossoms in February and March; and the seeds ripen towards the close of the rainy season.

Trunk when full grown about two feet in circumference, covered with scabrous, light brown bark. *Branches* and *branchlets* very numerous, and of great extent, the tender shoots hoary. *Leaves* alternate, petioled, oblong and elliptic, obtuse, finely veined, smooth; from two to three inches long, and one or one and half broad. *Petioles* one-fifth or one-sixth the length of the leaves, margins somewhat winged. *Stipules* none. *Panicles* terminal, large, open, and hoary. *Bractes* ensiform, villous, one-flowered. *Flowers* numerous, very small, I. hoary, of a greenish yellow colour. *Calyx* five-parted, clothed with short, white hairs. 587 *Petals* five, oblong, concave, spreading, hoary with short, soft, white hairs. *Filaments* five, very short, and inserted into the middle of the petals. *Anthers* sub-sagittate, resting on the exterior half of the petals. *Germ* round, one-celled, containing a single *ovulum* attached to the bottom of the cell. *Style* short. *Stigma* headed, sub-trunco-. *Drupe* the size of a grain of black-pepper, round, crowned with a small point, smooth, succulent, when ripe black, when dry wrinkled and very much like that spice, one-celled. *Nut* brittle, rugose, one-celled. *Seeds* solitary, roundish, with a cavity at the base. *Integuments* two. *Perisperm* conform to the seed. *Embryo* curved transversely, with the convexity up. *Cotyledons* two, minute, oval, lodged on the side of the base of the perisperm. *Radicle* filiform, of a curved, serpentine form, with its apex near the margin of the perisperm considerably above its base, on the side opposite to where the cotyledons are lodged, nearly as in Gaertner's *Anguillaria*, and in *Ardisia*.

The natives of the hills in the vicinity of Silhet, where the plants grow abundantly, gather the little drupes, and when dry sell them to the small traders in black-pepper, who fraudulently mix them with that spice, which they so resemble as to render it almost impossible to distinguish them by sight, and they are somewhat spicy withal.

2. E. *robusta. R.*

Arboreous. *Leaves* from oblong to oval, smooth. *Racemes* axillary and terminal, solitary.

Found by Mr. Roxburgh on the Rajamahal hills; from thence he sent the seeds to this garden, where in six years the plants produced from them were about ten feet high, with an erect, [illegible] stem, and spreading branches, covered with smooth, ash coloured bark. The young shoots are somewhat angular and downy.

Carey Ed. I 588

Leaves alternate, short-petioled, oval, smooth, entire, from two to three inches long, by one and half or two broad. *Racemes* axillary, solitary, simple, much shorter than the leaves. *Bractes* solitary, subulate, one-flowered. *Flowers* small, short-pedicelled, greenish white, rather inconspicuous. *Calyx* five-leaved, or deeply five-cleft, ovate, villous. *Corol* five-petalled, ovate, first spreading, afterwards revolute; thrice the length of the calyx, villous. *Filaments* five, short; inserted on the petals. *Anthers* cordate. *Germ* superior, ovate, one-celled, containing one *ovulum*, attached to the bottom of the cell. *Style* short. *Stigma* rather enlarged, but simple. *Berry* dry, spherical, size of a grain of pepper, one-celled, one-seeded. *Seed, perisperm* and *embryo* as in the former species, viz. copious *perisperm*, with transverse, serpentine embryo, as in Gærtner's *Anguillaria*, i. 372. *t.* 77.

3. E. *vestita. Roxb.*

Shrubby, scandent, very ramous. *Leaves* oblong-lanceolate, attenuate, sub-serrulate. *Racemes* axillary.

Oauor Baberung, the vernacular name in Silhet, where it is indigenous in the forests, climbing over trees and shrubs for support. It is uncommonly well furnished with branchlets and foliage. The flowers are particularly small and delicate, collected in little oblong, subsessile, axillary racemes. They appear in January.

CORDIA. Schreb. gen. N. 350.

Calyx one-leaved. *Corol* sub-campanulate, five-parted. *Germ* four-celled; *cells* one-seeded; *attachment* lateral. *Drupe* superior, with a four-celled nut, one or two of which only are fertile. *Embryo* inverse, without perisperm.

1. C. *latifolia. R.*

Polygamous. *Leaves* round-cordate, entire and repand, three-nerved. *Panicles* terminal and lateral. *Drupes* oblate-globose, on a smooth calyx. Nut from one to four-seeded.

I. 589

Hind. Bura-lesoora.

A native of Hindoosthan and introduced by the late General Martin, into the Botanic garden at Calcutta, where it blossoms during the cold season; and the fruits ripen in June and July. They are much larger than those of C. *Myxa*, smooth, and of a beautiful pale straw colour covered with a whitish bloom.

Trunk short and generally crooked, as in *Myxa;* the bark also scabrous and crooked. *Branches* numerous, spreading, and drooping; *young shoots* angular and smooth; the general height of trees ten or twelve years old is about twenty feet. *Leaves* alternate, petioled, from round to cordate and ovate, often slightly repand, three-nerved; texture hard, smooth above, scabrous and pale underneath, from three to seven, or even eight inches long, and rather less in breadth. *Petioles* nearly round, and smooth. *Stipules* none. *Panicles* short, terminal and lateral, roundish; *ramifications* alternate, diverging, and once or more dichotomous. *Flowers* numerous, small, white. *Bractes* minute, villous. *Calyx* villous, campanulate, leathery; *mouth* unequally dentate. *Corol* short, campanulate; *segments* five, linear-oblong. *Filaments* as long as the segments of the corol, and inserted immediately under their fissures. *Anthers* incumbent. *Germ* ovate, four-celled; with one ovulum in each attached to the upper end of the axis. *Style* short. *Stigma* four-cleft; *segments* four-cleft, long, rugose, and recurvate. *Drupe* oblate-spheroidal, about an inch or an inch and a quarter in diameter, smooth, when ripe yellow. *Pulp* in large quantity, soft, clear, and very clammy; (the natives eat it freely,) one-celled. *Nut* nearly circular, laterally compressed, rugose on the outside, with a cavity at each end, the lower one deeper than the other, exceedingly hard, four-celled, though rarely all fertile. *Seed* solitary, ovate-oblong. *Integument* single, white, soft and oily. *Plumula* very small. *Radicle* conic, superior.

I. 590

Mr. Henry Colebrooke, who is intimately acquainted with Hindoo literature, informs me that the writers on Indian *Materia Medica* notice two sorts of *Sepistan*. The first as large as a prune, with its nut immersed in mucilaginous pulp, and separable from it. The second smaller, with its nut adhering to the pulp (as described by our writers on *Materia Medica* in Europe), but with less mucilage, and sweeter than the large one. The rest of the descriptions, he observes, is common to both kinds, viz. The leaf round, the fruit growing in clusters, when ripe yellow, but afterwards turning black, &c.

The first, or large sort, is no doubt, the fruit of the tree just now described: and the small sort that of *Cordia Myxa*, which has hitherto, I believe, been considered in Europe, as the only tree which produces this drug; but from the information furnished by Mr. Colebrooke we have reason to believe there are two sorts used in medicine by the Asiatics, which are the produce of two trees of the same genus, and that the Arabic and Persian names Sepistan and Pistan, are applicable to both sorts.

It might be well to give the trivial or specific appellation *Sepistana* to this broad-leaved tree, which for the present I have called *latifolia;* and the scarlet-flowered West India tree, now called *Sebestena*, I would term *coccinea*. *Novella nigra. Rumph. Amb.* 2. *p.* 226. *t.* 75. is no doubt a distinct species, which I have seen and examined, and call *Cordia campanulata.*

2. C. *Myxa. Willd.* i. 1072.

Polygamous. *Leaves* oval, repand. *Panicles* terminal, and lateral.

Vida-marum. *Rheed. Mal.* 4. *t.* 37.

Sebestena *officinalis Gært. sem.* 1. *p.* 363. *t.* 76.

Beng. Bohooari.

Hind. Lusora, or Lesoora.

Teling. Nekra.

The dried fruit of this tree is the Sebestena of the *Materia Medica.*

It is a pretty large, but low tree, growing in most parts of the Circars, but chiefly in gardens, hedges, &c. near villages. Flowers about the end of the temperate, (or cold) season, and the fruit is ripe in May and June.

Trunk generally crooked, from eight to twelve feet high, and as thick or thicker than a man's body. *Bark* gray, cracked in various directions. *Branches* numerous, spreading, and bent in every possible direction, forming a dense shady head. *Leaves* scattered, petioled, ovate, oval, or obovate, exterior half slightly scolloped, or toothed, smooth above, below a little scabrous when old; from two to three inches long, and from one and a half to two broad. *Petioles* about one-third the length of the leaves. *Stipules* none. *Panicles* terminal, and also lateral, globular, dichotomous. *Bractes* none. *Flowers* numerous, small, white, a very large proportion of them are sterile, and they always want the *style*. *Calyx* tubular, widening towards the mouth and there torn as it were into three or five divisions, smooth, not in the least striated. *Corol, divisions* of the border revolute. *Style* in the *fertile flowers* as in the genus, in the *barren flowers* wanting. *Drupe* globular, smooth, the size of a cherry, sitting in the enlarged calyx, when ripe yellow, the pulp is almost transparent, very tough and viscid. *Nut* cordate, at both ends bid-entate and perforated, rugose, somewhat four-sided, four-celled, but it rarely happens that all prove fertile. *Seeds* solitary.

The smell of the nut when cut, is heavy and disagreeable, the taste of the kernels like that of fresh filberts. The fruits are not used in this part of India, (the Northern Circars), for any medicinal purpose. When ripe they are eaten by the natives and also, most greedily, by several sorts of birds being of a sweetish taste.

The wood is soft, and of little use except for fuel. It is reckoned one of the best kinds for kindling fire by friction.

3. C. *serrata. R.* I. 592

Arboreous, tender parts hairy. *Leaves* ovate-cordate, serrate, acuminate. *Corymbs* lateral. *Flowers* sub-octandrous; with from seven to nine-cleft corol.

A native of Travancore, from thence the seeds were sent by Dr. A. Berry to the Botanic garden at Calcutta, where the plants reared from them blossomed in August, when four years old.

Trunk in our young trees from eight to ten feet high, and about as thick as a man's thigh. *Branches* very numerous, spreading in every direction. *Bark* of the old woody parts smooth, olive-colour, that of the *young shoots* green, and hairy. *Leaves* alternate, rather long-petioled, ovate-cordate, serrate, acuminate, a little harsh, with few hairs, from four to six inches long, and from two to four broad. *Stipules* none. *Corymbs* lateral, and about the forks of the branchlets, long-peduncled, dichotomous. *Flowers* white, of a middling size. *Calyx* sub-cylindric; mouth from three to five-toothed, with the inside hairy. *Corol* with a cylindric tube, the length of the calyx, border about eight-cleft; *segments* oblong, recurved. *Filaments* about eight, hairy, inserted on the tube of the corol below its middle. *Anthers* ovate, small. *Germ* superior, conical, four-celled, with one *ovulum* in each, attached to the axis. *Style* two-parted, as are also the segments.

4. C. *monoica. Willd.* i. 1072. *R. Corom.* 1. 58.

Leaves ovate, three-nerved, scabrous. *Corymbs* axillary and terminal, with many male flowers. *Nut* four-celled.

Teling. Panugeri.

Hind. Pida.

A small, irregular, poor looking tree, with gray bark, chiefly a native of the Circar forests, where barren land predominates. *Leaves* deciduous during the cold season. The *flowers* are produced during the rainy season.

Leaves alternate, petioled, ovate, three-nerved, very scabrous; about three inches long, and two broad. *Petioles* round, scabrous, about an inch and a half long. *Panicles* from the divisions of the branchlets, or terminal, small, two-forked, composed of short, recurved one-ranked spikes. *Flowers* white. There is a very large share of male or barren flowers which generally occupy distinct parts of the corymbs, and frequently the whole. *Hermaphrodite flowers* as in the family. *Drupe* the size of a cherry, pointed, yellow, pulpy: pulp glutinous, as in *Myxa*. *Nut* perforated at the apex, four-celled. The *male flowers* want the style entirely, but have the rudiment of a germ. I. 593

5. C. *grandis. R.*

Leaves round-cordate, obtuse, entire, scabrous, sub-triple-nerved. *Panicles* terminal, drooping. *Flowers* tetrandrous. A large quick growing tree, native of Chittagong; in the Hon. Company's Botanic garden its leaves are often a foot long; its immensely large, dichotomous, very ramous panicle nearly as much; the calyx has an even surface and four-toothed mouth.

6. C. *campanulata. R.*

Leaves long-petioled, ovate-cordate, repand, acute. *Panicles* lateral. *Corol* campanulate. *Drupes* ovate, dry, hid in the permanent calyx.

Novella nigra. *Rumph. Amb.* 2. 75. is no doubt this plant, though it has hitherto been quoted for *Cordia Sebestena,* which is also now before me from the West Indies, in full blossom in the Botanic garden at Calcutta, and differs from *Novella nigra* in the following respects.

1*st.* In having larger, cordate, almost entire, obtuse, scabrous leaves; whereas in C. *campanulata* they are smaller, longer-petioled, more ovate, repand, and very acute.

2*d.* In having corymbs on *terminal* panicles, with infundibuliform corols; on the other hand in *campanulata* the panicles are lateral, and the corol *campanulate.* In both, the *calyx, stamina,* and *pistillum* are nearly alike.

Drupe (in *campanulata)* ovate, pointed with the permanent base of the style, and completely covered with the thin dry permanent calyx; instead of pulp, as in the other species, there is a thick coat of a dry, firm, friable texture, scarcely differing in colour from the nut. *Nut* five-ribbed, with as many fluted grooves between, very hard, light brown, adhering firmly to its friable covering, four-celled, though it is rare to find all fertile, perforated up through the centre. *Seed* solitary, ovate, pointed. *Integument* single, pure white, thick, soft, and tender. *Perisperm* none. *Embryo* inverse, pure white *Cotyledons* deeply grooved, as in *Sebestena officinalis, Gært. sem.* 1. 364. *t.* 76. *p.* 1. *Plumula* small, two-lobed. *Radicle* roundish, superior.

I. 594

7. C. *muluccana. R.*

Leaves long-petioled, ovate-cordate, obtuse, entire, smooth. *Panicles* axillary and terminal, shorter than the leaves; *calyx* gibbous, inside hairy. *Style* twice two-cleft. *Drupe* pointed, and nearly hid in the calyx; *nut* four-celled.

A native of the Moluccas. This species is often tetrandrous. The filaments are short, and very hairy; as is also a rim round the mouth of the gibbous tube of the corol, where they are inserted.

8. C. *polygama. R.*

Polygamous. *Leaves* ovate-cordate, entire, scabrous. *Panicle* terminal. *Male* generally tetrandrous, *hermaphrodite* often pentandrous.

A tree, a native of the mountains of Coromandel. Flowers about the month of May, and the seeds ripen in August.

Trunk tolerably straight, but short. *Bark* pretty smooth, of a dark olive colour. *Branches* spreading; *youny shoots* round and scabrous. *Leaves* alternate, petioled, from ovate to cordate, entire, or slightly scollop-toothed; when young soft and villous, when old scabrous, from one to six inches long, and about three-fourths of that broad. *Stipules* none. *Panicles* terminal, in the male more divided, pubescent. *Flowers* small, white.

I. 595

Hermaphrodite Flowers on a separate tree. *Calyx* narrow-campanulate; *mouth* irregularly four or five-toothed, villous on the outside. *Corol* funnel-shaped. *Border* four or five-cleft; divisions linear, revolute. *Filaments* four, or five, shorter than the segments of the border of the corol. *Anthers* incumbent. *Germ* superior, ovate, four-celled, with one *ovulum* in each, *attached* to the axis. *Style* twice two-cleft. *Stigma* rather small, but rounded. *Drupes* oval, the size of a black currant, smooth, when ripe yellow. *Pulp* mucilaginous, as in the officinal fruit of C. *myxa,* one-celled. *Nut* very hard, ovate, longitudinally perforated through the centre, four-celled. *Seed* solitary, ovate, &c. &c. almost exactly as in *Sebestina officinilis, Gært. sem.* 1. *p.* 364. *t.* 76. *p.* 1.

Male Flowers on a different plant. *Calyx* and *corol* as in the hermaphrodite, but more generally divided into four. *Filaments* generally four, as long as the corol. *Germ* a spherical, abortive body, without style or stigma.

Obs. In the early part of my botanical career, a very short description and drawing of the male plant were sent with my other dispatches of the same nature, to the Honourable the Court of Directors under the name *Callicarpa alternifolia. Roxb. N.* 165.

9. C. *angustifolia. R.*

Leaves sub-opposite, lanceolate, scabrous. *Panicles* terminal. *Flowers* tetrandrous. *Style* twice two-cleft. *Nut* four-celled.

A native of Mysore, from thence Dr. Buchanan sent the seeds to the Botanic garden at Calcutta, in 1800, and in May 1803, the trees were in blossom for the first time.

Trunk short. *Branches* numerous, spreading in every direction, with their long, slender extremities often drooping. *Bark* ash-coloured and pretty smooth. *Leaves* sub-opposite, petioled, lanceolate, generally entire, obtuse, scabrous, particularly when dry; about four inches long, by one broad. *Petioles* short, channelled. *Stipules* none. *Panicles* terminal, corymbiform. *Flowers* numerous, small, white. *Calyx* cylindric; mouth obscurely four-toothed. *Corol; tube* longer than the calyx. *Border* of four linear, revolute divisions. *Filaments* four, inserted just below the divisions of the border. *Style* two-cleft, with two-cleft divisions. *Drupe* the size of a large pea, round, smooth, yellow, when ripe the pulp is yellow, gelatinous, and pellucid. *Nut* four-celled, though seldom more than one seed comes to maturity.

I. 596

EHRETIA. Schreb. gen. N. 352.

Calyx five-parted. *Corol* one-petalled, five-parted. *Stigma* two-cleft. *Drupe* superior, with a four-partible nut, or with one or two from two to six-celled nuts.

1. E. *serrata. R.*

Leaves broad-lanceolate, serrate, five-pointed, smooth. *Flowers* panicled. *Style* half two-cleft. *Drupes* with two two-celled nuts.

This tree has been introduced from Bhotan, and is now growing and bearing fruit in Dr. Glass's garden at Bhagulpoora. It is also a native of the eastern part of Bengal. Flowering time the beginning of the hot season.

Leaves alternate, petioled, oblong, and broad-lanceolate, acutely serrate, smooth on both sides; from two to five inches long, and from one to two and a half-broad. *Petioles* short, slender, and smooth. *Stipules* none. *Panicles* terminal, and from the exterior axills, ovate-oblong, with numerous, short, spreading, compound, and simple ramifications. *Flowers* small, numerous, collected into small, somewhat remote, sub-sessile fascicles; some of them hexandrous. *Bractes* ovate, small, pressing on the calyx. *Calyx* five-cleft. *Corol; tube* as long as the calyx; divisions of the border oblong and spreading. *Filaments* in the mouth of the

I. 597

tube of the corol, and rather shorter than the border. *Anthers* ovate. *Germ* roundish. *Style* as long as the stamens, half two-cleft. *Stigma* obtuse. *Drupes* round, pulpy, when ripe red, and about the size of a pea. *Nuts* two-celled, they are flat on one side, and convex on the other. The above description is taken from trees sent to the Botanic garden by Dr. Glass, who says the fruit is delicious. Plants of the same have also been received from Dr. Buchanan, but with him, about Lukshmeepoora where the tree is indigenous the fruit is not esteemed, indeed they have little or no pulp on them. The others have but little, what they have is, however, palatable. Both now have been twelve years in the Botanic garden. The trees are about thirty feet high, ramous, and stout in proportion. Page Carey Ed.

2. E. *laevis. Willd.* i. 1077. *Roxb. Corom.* 1. 56.

Arboreous. *Leaves* ovate, smooth. *Corymbs* lateral, composed of dichotomous, recurved, secund spikes. *Drupes* with a four-partible nut.

Teling. Seregada.

The species grows to be a pretty large tree. It is a native of the Circar mountains.

Trunk erect. *Bark* ash-coloured. *Branches* numerous, nearly erect. *Leaves* alternate, short-petioled, oval, sometimes scolloped, pretty smooth, from three to four inches long, and two or three broad. *Corymbs* lateral or axillary, two-forked, composed of thin, recurved, one-ranked spikes. *Flowers* white, small.

The parts of fructification as in the last, except that here the seeds or nuts are wrinkled on the outside. The chief specific difference is in the corymbs, there they are terminal, here lateral or axillary.

The wood of this tree is used by the hill people for many purposes. I.

3. E. *aspera. Willd. spec.* i. 1077. *Roxb. Corom.* 1. 55. 598

Shrubby. *Leaves* ovate, above scabrous, below downy. *Corymbs* terminal, dichotomous. *Drupe* with a four-celled nut.

Teling. Tella-joovi.

A small bushy tree, a native of dry rocky barren places. Flowers during the wet season.

Trunk and larger *branches* covered with dark, rust-coloured bark; *young shoots* downy. *Leaves* alternate, petioled, ovate, above scabrous, downy underneath, from two to three inches long, and from one to two broad. *Petioles* channelled, about an inch long. *Corymbs* terminal, globular, composed of dense, recurved, one-ranked spikes; *divisions* always two-forked. *Flowers* very small, white. *Calyx; divisions* ovate, outside downy. *Corol; tube* gibbous. *Style* two-cleft. *Stigma* simple. *Berry* the size of a grain of pepper, red, marked with four angular elevations corresponding with the angles of the four-celled nut. *Nut* four-celled, or by exposure four-partible, smooth.

4. E. *uniflora. R.*

Shrubby, twiggy. *Leaves* crowded, sub-sessile, oblong, entire, hairy. *Flowers* solitary sub-sessile. *Drupe* with four one-celled nuts.

A native of the Moluccas.

5. E. *setosa. R.*

Tender parts bristly. *Leaves* ovate-cordate, acuminate. *Panicle* terminal, composed of dichotomous, secund, recurved spikes. *Drupe* with four one-celled nuts.

A native of the Island of Hamoa.

6. E. *buxifolia. Willd.* i. 1079. *R. Corom. pl.* 1. *N.* 57.

Shrubby. *Leaves* wedge-shaped, apex tridentate, scabrous. *Peduncles* from two to six-flowered. *Nuts* five or six-celled. I.

Cordia *retusa. Vahl. symb.* ii. *p.* 42. 599

Teling. Bapana-booree.

A middling-sized, ramous shrub or small tree, very common on barren lands and in forests. Flowering time the wet season.

Leaves on the young shoots alternate, on the former branchlets fascicled, sessile, reflexed, wedge-formed, very scabrous, very hard above, shining, from half an inch to an inch long, and a quarter or half an inch broad. *Peduncles* from amongst the leaves on the woody branchlets, from two to six-flowered. *Pedicels* very short. *Flowers* small, white. *Calyx* five-parted; *divisions* lanceolate, as long as the corol. *Corol* campanulate. *Border* five or six-cleft. *Stamens* five or six, shorter than the corol. *Style* two-cleft. *Stigmas* simple. *Berry* the size of a pea, succulent, red. *Nut* five or six-celled.

7. E. *internodis. Willd.* i. 1077.

Arboreous. *Leaves* oblong, entire, smooth. *Panicles* terminal and lateral.

Found indigenous at the Mauritius by Colonel Hardwicke.

CHRYSOPHYLLUM. Schreb. gen. N. 355.

Calyx five-leaved. *Corol* campanulate, five-parted, (ten, Linn.) *Germ* five-celled; *cells* one-seeded; *attachment* interior. *Berry* superior, five-seeded, (ten, Linn. one or ten, Gært.) *Embryo* erect, and furnished with a perisperm.

1. C. *acuminatum. R.*

Leaves lanceolate, smooth. *Flowers* axillary. *Fruit* globose, five-seeded.

Pitakara is the vernacular name about Silhet, where the tree is indigenous, and blossoms in April. The fruit ripens in October, and is greedily eaten by the natives; though to me the taste is by no means agreeable; the pulp being almost insipid, and though tolerably firm, uncommonly clammy, adhering to the lips or knife, with great tenacity. I. 600

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A middling-sized tree, with numerous slender, smooth, round branchlets.

Leaves alternate, short-petioled, lanceolate, entire, acuminate, polished on both sides, except while young, then clothed with ferruginous down; *veins* small, simple and parallel; from three to four inches long, and one and a quarter broad. *Peduncles* axillary, several together, recurved, one-flowered. *Flowers* minute, pale yellow. *Calyx* five-leaved, leaflets oval. *Corol* one-petalled. *Tube* the length of the calyx, border five-parted, segments oval. *Filaments* five, inserted into the tube of the corol near the base. *Anthers* in the mouth of the tube. *Germ* inferior, ovate, very hairy, five-celled, with one ovulum in each, attached to the middle of the axis. *Style* short. *Stigma* five-lobed. *Berries* spherical, size of a small crab-apple, smooth, when ripe yellow. *Pulp* in considerable quantity, five-celled. *Seeds* solitary, attached to the axis by the greater part of the length of the thin inner edge, smooth, polished, of a shining brown colour. *Perisperm* conform to the seed, yellowish. *Embryo* extended through the whole perisperm, erect. *Cotyledons* obliquely ovate, thin, three-nerved. *Radicle* curved, sub-cylindric, inferior.

TECTONA. Schreb. gen. N. 356.

Calyx five-toothed, becoming inflated over the growing pericarp. *Corol* one-petalled. *Germ* four-celled; *cell* one-seeded; *attachment* central. *Drupe* superior, dry, hid in the calyx. *Nut* four-seeded. *Seed* solitary. *Embryo* erect, without perisperm.

1. T. *grandis. Willd. sp.* i. 1088. *Roxb. Corom.* 1. *N.* 6.

Tekka. *Rheed. Mal.* iv. *p.* 57. *t.* 27.

I. Jatus. *Rumph. Amb.* iii. *p.* 34. *t.* 18.

601 *Teling.* Teek.

Can. Jaadi.

Beng. Sagoon, or Segoon.

This most useful tree is a native of various parts of India, viz. the mountainous parts of the Malabar and Coromandel coasts, of the mountains bordering on the banks of the Godavuree above Rajamundri, and of Pegu. Lord Cornwallis and Colonel Kyd have sometime since begun to introduce it into Bengal, where it thrives well. On this coast it flowers in June and July. The seeds ripen in September and October. In Bengal, the leaves are deciduous during the cool season; and the new foliage appears in May, a few weeks before the flowers.

Trunk erect, growing to an immense size. *Bark* ash-coloured and scaly. *Branches* numerous, spreading; *young shoots* four-sided, sides channelled. *Leaves* opposite-petioled, spreading, oval, a little scolloped, above scabrous, below covered with whitish, rather soft down, they are larger at a distance from the flowers and on young trees, viz. from twelve to twenty-four inches long, and from eight to sixteen broad. *Petioles* short, thick, laterally compressed. *Panicles* terminal, very large, cross-armed; *divisions* dichotomous, with a sessile fertile flower in each cleft; the whole covered with a hoary coloured, farinaceous substance. *Peduncles* common, quadrangular; sides deeply channelled, angles obtuse. *Bractes* opposite, lanceolate, two at each sub-division. *Flowers* small, white, very numerous. *Calyx* and *corol* as described by König, only oftener six than five-cleft. *Nectary* very small, frequently wanting. *Stamens* often six. *Germ* superior, round, hairy, four-celled, with one ovulum in each attached to the axis. *Stigma* two-cleft, divided, obtuse, spreading. *Drupe* within the enlarged, inflated, dry calyx, obtusely four-sided, woolly, spongy, dry. *Nut* exceedingly hard, four-

I. celled, &c. as accurately described by *Gærtner, carp.* i. 257. *t.* 7.

602 The wood of this tree, the only useful part of it, has from long experience been found to be by far the most useful timber in Asia; it is light, easily worked, and at the same time both strong and durable. That which grows on the mountains on the banks of the Goduvuree, is beautifully veined, and considerably closer in the grain, and heavier than any other I have seen. It is therefore particularly fit for furniture, gun-carriages, &c. For ship-building it is reckoned superior to every other sort of wood; being light, strong, and very durable, either in or out of the water.

Pegu produces the largest quantity, and their large rivers enable the natives to bring it down to the sea-ports from the interior mountainous parts of the country, where it grows, at a cheap rate; which enables them to sell it lower than in any other part of India.

SIDEROXYLON. Schreb. gen. N. 357.

Calyx five-cleft. *Corol* rotate, five-cleft. *Nectary* five-leaved, inserted on the fissures of the corol, alternate with the stamina. *Stigma* simple. *Berry* superior, five-seeded. *Embryo* erect.

1. S. *tomentosum. Willd.* i. *p.* 1090. *R. Corom. pl.* 1. *N.* 23.

Unarmed. *Leaves* alternate, oblong, waved, downy. *Flowers* axillary, fascicled. *Berry* with from one to five seeds.

A small tree, a native of the tops of mountains chiefly. Flowering during the hot season.

Trunk erect. *Bark* ash-coloured. *Branches* erect, very numerous. *Leaves* alternate, short-petioled, oval, a little scolloped, when full grown smooth; when young covered with much rust-coloured down; from three to five inches long, and one and a half broad. *Peduncles* axillary, numerous, short, downy, bowing, undivided, one-flowered. *Flowers* small,

I. dull white. *Calyx* below, five-leaved; *leaflets* imbricated, downy, permanent. *Corol* one-

603 petalled. *Tube* short, inside downy, margin simple, five-parted; *segments* spreading, half lanceolate, acute, waved. *Nectary* leaflets five, alternate, with the filaments, waved, length

of the stamens. *Stamens* five. *Germ* ovate, hid in the tube of the corol *Berry* ovate, size of an olive. *Seeds* generally one or two, though there are the rudiments of five in the germ. Page Carey Ed.

RHAMNUS. Schreb. gen. N. 358.

Calyx five-parted. *Corol* five-petalled. *Germ* sunk in the saucer-shaped nectary; from two to three-celled; *cells* one-seeded; *attachment* inferior. *Berry* superior, from one to three-seeded. *Embryo* erect; perisperm scanty.

1. R. *inconus. R.*

Unarmed, odorous. *Leaves* ovate-lanceolate, entire, smooth above, hoary underneath. *Stipules* filiform. *Corymbs* on small axillary branchlets. *Style* three-cleft.

Reared in the Botanic garden at Calcutta from seed received from the Moluccas. Flowering time the cold season.

Trunk straight. *Branches* numerous, nearly horizontal. *Branchlets* alternate, bifarious. *Bark* smoooth; that of the woody parts ash-coloured, that of the young shoots green. *Leaves* alternate, bifarious, petioled, ovate-lanceolate, entire, smooth above, very white underneath; length from two to twelve inches, and from one to five broad. *Stipules* filiform. *Corymbs* alternate, on small, sub-erect, axillary branchlets. *Flowers* very numerous, small, greenish yellow. *Calyx* villous on the outside, and keeled on the inside. *Corol* petals (scalets, Linn.) cuneate, concave. *Style* three-cleft. *Berries* round, smooth, united to, and resting on the remaining calyx, the size of a small cherry, when ripe black, and filled round the seeds with a dry mealy substance. *Seeds* three when all come to perfection, which is seldom the case, slightly united.

2. R. *circumscissus. Willd. sp.* i. 1001. I. 604

Shrubby, armed with sub-opposite recurved prickles. *Leaves* sub-opposite, round-obcordate, dentate, polished. *Umbellets* axillary.

A native of the forests of India, where its long straggling branches armed with the most acute, strong, recurved thorns give the most cautious travellers infinite pain and trouble. Flowering season the months of January, February, and March; the seeds take nearly a year to ripen.

Trunk short, soon dividing into many, long, straggling, scandent branches; with numerous, diverging, alternate, round, smooth, armed branchlets. *Spines* on the lateral branches axillary, solitary, rather longer than the petioles, coloured, very sharp, and a little recurved; the leading shoots are unarmed. *Leaves* sub-opposite, short-petioled, round-cordate, dentate, firm and polished on both sides; about three-quarters of an inch each way. *Stipules* small, caducous. *Umbellets* axillary, solitary, very small, from ten to twelve-flowered, the floriferous axills bear no thorns. *Calyx* globe-campanulate, five toothed. *Petals* or *scales* crescent-shaped. *Germ* ovate. *Style* scarcely any. *Stigma* somewhat two-lobed. *Berry* a little depressed and umbilicate, smooth, the size of a marrowfat pea, having the base covered by the remaining calyx. *Seeds* five when all come to maturity.

3. R. *virgatus. R.*

Shrubby, erect, spines terminal. *Leaves* oblong-ventricose, serrate. *Flowers* round the base of the young shoots and axillary, tern; *corol* four-cleft. *Stigma* two or three-cleft.

A native of Nepal, from thence Dr. Buchanan sent seeds to the Botanic garden at Calcutta in 1802, where the plants grow freely to the size of a very large shrub; they blossom in March, and ripen their seed in October and November.

Trunk not very short, distinct from the branches, all are erect, dividing and sub-dividing into long, terminal, straight, unarmed twigs, and short, rigid, lateral spinous pointed branchlets, bark of the old woody parts beautifully variegated with ash-colour and brown, that of the young shoots smooth and green. *Leaves* alternate, rarely sub-opposite, short-petioled, reclinate, oblong-ventricose, serrate, pretty smooth on both sides; from one to three inches long, and from half an inch to an inch broad. *Stipules* petiolary, ensiform, ciliate, base permanent. *Peduncles* from the scales which embrace the base of the young shoots, and axillary, generally tern, slender, one-flowered. *Flowers* very small, yellow. *Calyx* campanulate, more generally four than five-cleft. *Corol* no other than the little scales of the genus, which are here very imperfect. *Filaments* four or five, as there are divisions in the border of the calyx, small. *Anthers* often imperfect. *Germ* two or three-lobed, ovate, smooth, from two to three-celled, with one ovulum in each, attached to the lower and inner angle of its cell. *Style* short. *Stigma* two or three-cleft; *segments* recurved. I. 605

It differs from R. *catharticus;* the only species known to me which it approaches in having a two or three-cleft stigma, with just as many lobes, cells, and seeds as in the germ, consequently the number of seeds in the berry can never exceed the contents of the germ. it cannot therefore be *catharticus,* which has a four-cleft stigma, and four-seeded berry.

4. R. *lucidus. R.*

Sub-arboreous, armed with short, opposite and solitary, recurved aculei. *Leaves* opposite, from round to oblong, emarginate, entire, polished and firm. *Peduncles* axillary, short, from two to four-flowered. *Berries* globular, generally two-seeded.

A small, very ramous tree, with far spreading and straggling, somewhat scandent branches; a native of Mauritius. It is very nearly allied to R. *circumscissus*, the chief difference is in the leaves being entire and retuse, or emarginate in this species.

ZIZIPHUS, Lamarck. I. 606

Calyx five-parted. *Corol* five-petalled. *Germ* hid in a crenulate, flat nectary, from two

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to three-celled; *cells* one-seeded; *attachment* inferior. *Drupe* superior, nut from one to three, or more, one-seeded. *Embryo* erect, with scanty perisperm, or none.

1. Z. *trinervia. R.*

Arboreous, unarmed. *Leaves* ovate-oblong, three-nerved, obtusely serrate, glossy. *Flowers* in axillary fascicles. *Stigma* two-cleft. *Drupes* spherical.

A native of Mysore; from whence Dr. Buchanan sent seed, to the Botanic garden at Calcutta in 1800, and in eight years the plants therefrom have grown to be beautiful small trees, of about twenty feet in height, with innumerable branches and branchlets spreading in every direction, with extremities often pendulous, and crowded with beautiful, dark green, glossy foliage. Flowering time in the Botanic garden March and April, the fruit ripens in September, October, and November.

Leaves alternate, bifarious, short-petioled, broad-lanceolate, or ovate-oblong, obtuse, strongly marked with three nerves, smooth, firm and glossy, obtusely serrulate, from one to five inches long, and from one to two and a half broad. *Stipules* filiform, caducous. *Flowers* numerous, small, greenish yellow, collected in little axillary fascicles. *Scales* of the corol small, and shorter than the recurved stamens. *Germ* ovate, immersed in the large, convex, fleshy receptacle, two-celled, with one *ovulum* in each, attached from the base to the bottom of the partition. *Style* scarcely any. *Stigma* two-cleft, divisions short and recurved. *Drupes* spherical, the size of a cherry, polished, of a lively yellow, one-celled. *Pulp* soft, gelatinous
I. and sweet. *Nut* obovate, considerably flattened, a little rugose, one or two-celled. *Seed* con-
607 form to the cell, of a brownish colour, and rather soft. *Embryo* nearly as long, and broad as the perisperm, and of the same colour, erect. *Cotyledons* two, nearly orbicular. *Radicle* obovate, inferior.

2. Z. *albens. R.*

Arboreous. *Prickles* solitary, recurved. *Leaves* obliquely oval, serrulate, downy underneath. *Corymbs* axillary, long-peduncled. *Corol* none. *Style* two-cleft. *Drupes* drooping, smooth, white.

Found by Dr. Hunter in Col. Palmer's garden, near Calcutta, in full flower, and with ripe fruit in April 1803. It was originally brought from China.

Trunk arboreous, with spreading branches. *Prickles* solitary on the under side, short, recurved, being nothing more than the indurated stipules. *Leaves* alternate, bifarious, short-petioled, three-nerved, obliquely oval, most slightly serrulate, downy underneath. *Stipules* subulate, the lower one hardens into a prickle, the other is caducous. *Peduncles* axillary, solitary, three or four times longer than the petioles, many-flowered. *Calyx* five-cleft. *Corol* none, nor any thing like the usual scales of the genus. *Style* two-cleft. *Drupe* round, the size of a small cherry, smooth, when ripe white, and pendulous. The pulp rather mealy and sweet. *Nut* turbinate, thin, two-celled, with a single seed in each.

3. Z. *latifolia. R*

Arboreous, prickles stipulary, short and recurved. *Leaves* oval, serrate, three-nerved, downy underneath. *Panicles* terminal. *Petals* wanting. *Drupe* turbinate. *Nut* one-celled.

This species is very rare. It is a native of mountainous tracts in the Circars and grows to be a small tree.

Prickles solitary, very thick, but short, recurved, a rigid pointed thorn-like stipule occupies the other side of the insertion of the petiole. *Leaves* alternate, short-petioled, bifarious,
I. oval, serrate, three-nerved, smooth, from four to six inches long. *Corymbs* terminal, and from
608 the exterior axills, forming a large oblong panicle. *Corol* none. *Nectary* as in the other species. *Anthers* three-lobed. *Germ* two-celled, one ovulum in each, attached to the bottom of the cell. *Drupe* turbinate, size of a cherry, yellow. *Nut* generally one-celled.

4. Z. *Jujuba. Willd. sp.* i. 1104.

Arboreous. *Leaves* obliquely-ovate, serrate. *Peduncles* axillary, many-flowered. *Thorns* stipulary, one recurved, the other straight. *Nuts* two-celled.

Perim Toddali. *Rheed. Mal.* iv. 85. *t.* 41.

Malum indicum. *Rumph. Amb.* ii. 117. *t.* 36.

Beng. Kool.

Hind. Bier.

Teling. Rengha.

On the coast of Coromandel this grows to be a small tree. Flowering time the rainy season; the fruit ripens after the rains.

Trunk seldom straight, yet not much bent. *Bark* scabrous, much and deeply cracked. *Branches* spreading in every direction; *branchlets* bifarious, flexuose; young parts a little downy. *Thorns* stipulary, very sharp; the under one recurved, the upper one straight. *Leaves* short-petioled, alternate, bifarious, obliquely-oval, serrate, with the apex often three-toothed, above smooth, below downy; from one to two inches long. *Flowers* axillary, crowded on sub-sessile umbellets. *Calyx* one-leaved, spreading, five-parted, *divisions* acute. *Petals* (scales of Linn.) five, wedge-shaped, apex large, concave, spoon-like, with its margin slightly crenulate; they are inserted on the inside of the divisions of the calyx. *Nectary* saucer-shaped, perforated for the pistillum, margin ten-notched. *Filaments* five, rather shorter than
I. the petals, and inserted immediately over them, so that the small oval anthers rest in their
609 concave apices. *Germ* above. *Style* two-cleft; *divisions* recurved. *Drupe* globular, size of a large cherry, smooth, yellow when ripe. *Nut* rough, two-celled. *Seed* solitary, affixed at the base.

The fruit is eaten by all classes of persons.

5. Z. *vulgaris. Willd. sp.* i. 1105.

Leaves obliquely oval, serrulate, three-nerved, hoary underneath. *Thorns* stipulary, one

straight, the other recurved. *Drupe* oblong. *Nut* sharp-pointed, two-celled. Page Carey Ed.

Z. *sativa. Gært.* i. *p.* 202. *t.* 43. *f.* 4.

A pretty large tree, often as large as a full-grown apple tree in England, a native of Persia and Hindoost'han; only found in gardens in Bengal, where it blossoms in August, and the fruit ripens in January.

6. Z. *nitida. R.*

Arboreous. *Thorns* stipulary, one projecting, one recurved. *Leaves* obliquely ovate-oblong, three-nerved, obtusely serrate, smooth. *Fruits* sub-cylindric; *nuts* two-celled.

Introduced from China into the Botanic garden at Calcutta, where it grows to be a small tree. Flowering time the hot season.

Root superficial, sending up many suckers for some yards round the tree. *Trunk* generally crooked. *Bark* brown, pretty smooth; branches few, flexuose, and thin of leaves. *Spines* stipulary, the upper one straight, long, and pointing much forward, the other shorter and recurved. *Leaves* alternate, short-petioled, obliquely oblong, emarginate, three-nerved, serrate, smooth, of a shining green on both sides, from one to two inches long. *Flowers* axillary, few, collected on short common peduncles; they are small, yellow, semi-digynous. *Drupe* oblong, pendulous and smooth, about an inch long, when ripe pale-yellow. *Nut* lanceolate, pointed at both ends, a little compressed, rugose, two-celled.

The fruits are eaten, but to my taste they are rather insipid. Innumerable suckers constantly rise from the root which run to a great distance from the parent tree, and make it a troublesome plant in a garden, but at the same time they render it easily propagated, if necessary. I. 610

7. Z. *Lotus. Lamarck Encyclop.* iii. 304. *Illustr.* 1. 185. *f.* 2.

Arboreous; *spines* stipulary, one long, slender, and straight, the other recurved. *Leaves* oval, three-nerved, most slightly crenulate serrate, smooth on both sides. *Flowers* axillary; *style* two-cleft.

Z. *Lotus. Willd.* i. 1103.

A native of Persia, &c.; blossoms in the hot season in the Botanic garden at Calcutta. It is readily known from its Indian congeners by the whiteness of its bark, and the pale yellow tinge of its long and very slender prickles.

8. Z. *elliptica. R.*

Arboreous. *Thorns* paired, the upper one rather incurved, the under one recurved. *Leaves* elliptically oval, serrulate, three-nerved, pale underneath. *Corymbs* axillary, dichotomous. *Flowers* semi-trigynous.

A stout straight tree, a native of Travancore, from thence introduced by Dr. A. Berry, into the Botanic garden at Calcutta, where it blossoms in May and June.

Trunk straight, but slightly bent to one side, covered with pretty smooth, brown bark. *Branches* and *branchlets* numerous, spreading much while young, and divaricated when old. *Young shoots* slightly villous, and flexuose. *Prickles* paired and stipulary; the upper one straighter and pointed forward; the under one much recurved. *Leaves* alternate, bifarious, short-petioled, elliptically oval with the base obliquely cordate, finely serrulate, three-nerved, smooth above, pale and soft underneath, from one to two inches long. *Stipules* subulate, soon becoming the sharp thorns above described. *Corymbs* axillary, much shorter than the leaves, several times dichotomous, villous, many-flowered. *Calyx, corol,* and *stamina,* as in the genus. I. *Germ* ovate, immersed in the receptacle, three-celled, with one *ovulum* in each, attached to the bottom of the cell. *Style* short, three-cleft. 611

9. Z. *Oenoplia. Willd. spec.* i. 1105.

Shrubby. *Thorns* solitary, recurved. *Leaves* unequally ovate-cordate, entire, acute; three-nerved, downy underneath. *Flowers* minute, crowded in the axills.

Native of various parts of India. Flowering time the close of the rains.

10. Z. *tomentosa. R.*

Shrubby. *Thorns* solitary, scarcely curved. *Leaves* unequally ovate-cordate, three-nerved, obtuse, minutely serrulate, hairy above, and tomentose underneath. *Panicles* lateral.

A short, very ramous shrub, a native of Chittagong, and there used for fences.

11. Z. *xylopyrus. Willd. spec.* i. 1104.

Arboreous. *Leaves* obliquely cordate, three-nerved, serrate, downy. *Thorns* when present stipularly, one recurved, the other straight. *Nuts* three-celled, three-valved.

Rhamnus *Xylopyrus. Retz. Obs.* ii. 11.

Telinga. Goti.

Common in every forest on the coast of Coromandel.

In a good soil it grows to be a pretty large tree, with a tolerably erect trunk, but in general it is found in the state of a large straggling shrub. *Bark* light ash-coloured, much cracked, corky; young parts covered with soft white down. The *prickles* in a poor soil are always present and stipulary, the under one recurved, the upper one erect and straight. *Leaves* alternate, short-petioled, bifarious, obliquely-cordate, serrate, three-nerved, downy, particularly on the under side, about two inches long. *Corymbs* axillary, small, many-flowered. *Flowers* as in the genus. *Style* three-cleft. *Drupe* the size of a large cherry, greenish and downy, I. marked round the base with the remains of the nectary. *Nut* three-celled, three-valved, the 612 valves separating when the nut has been sometime exposed to the weather, leaving a centrical three-sided receptacle. *Seeds* one in each cell, orbicular, compressed, affixed at the base to the receptacle.

Cattle eat the leaves, young shoots, and fruit. The kernels taste like filberts, and are eaten by the natives.

The wood of the largest trees is much esteemed by the natives; being yellowish or orange-

Page Carey Ed. coloured, very hard and durable, and at the same time not very heavy.

12. Z. *Caracutta. Buch.*

Arboreous. *Thorns* in pairs; the under one recurved, the upper one straight. *Leaves* round, serrulate, three-nerved. *Peduncles* axillary, very short, many-flowered. *Style* three-cleft. *Drupe* oval, with a three-celled nut.

A native of the southern parts of Mysore, and there known to the natives by the name Karakutta. Seeds sent from thence by Dr. Buchanan to the Botanic garden at Calcutta produced plants, which in four years were about ten feet high, with a tolerably erect, stout trunk, and many spreading crooked branches; covered with smooth, dark ash-coloured bark. The young shoots are round, and villous. They blossom in April, and the fruit ripens in December.

Thorns in stipulary pairs, the lower one recurved, the upper one straight, both are hard, smooth, and acute; where the flowers are, the thorns are generally deficient. *Leaves* short-petioled, obliquely round-cordate, or nearly round, obtuse, or retuse, serrulate, three-nerved; while young somewhat villous; from one to two inches long, and nearly as broad. *Peduncles* axillary, very short, bearing many small, short-pedicelled, greenish-yellow flowers. *Style* three-cleft. *Drupe* the size of a large cherry, oval, depressed a little at both ends, smooth, dark-
I. brown; fleshy part tough, firm, and yellowish. *Nut* roundish, a little uneven on the outside,
613 very hard and thick, three-celled. *Seeds* solitary, attached to the bottom of the cell, nearly round, compressed, convex on the inside. *Integuments* two; the *exterior* firm, light, brown, and polished; the *inner* thin and softer. *Perisperm;* when the seed is ripe, there is only on each side of the embryo a white, fleshy lamina; but at this period not connected round its margins, as before maturity. *Embryo* erect; *cotyledons* two, nearly five-nerved. *Radicle* inferior, oval, just within the umbilicus.

13. Z. *microphylla. R.*

Shrubby; *branchlets* bifarious, flexuose. *Thorns* stipulary, one straight, the other recurved. *Leaves* ovate, three-nerved, serrulate, woolly underneath. *Flowers* fascicled. *Stigma* two-cleft.

Jujubas zizyphus zeylanica. *Pluck. Alm.* 199. *t.* 197. *f.* 2.

Rhamnus nummularia. Burm. Ind. 61.

Common on barren uncultivated lands on the Coromandel coast. Flowering time the beginning of the rainy season.

Stem scarcely any, but many slender, rigid, bifarious, flexuose branches spreading in all directions, and forming a small bush. *Bark* covered with a light-coloured, almost white pellicle. *Thorns* stipulary, the upper one straight, slender, but very sharp, and as long as the leaves. The under one shorter, and much recurved. *Leaves* alternate, bifarious, very short-petioled, ovate and oval, serrulate, above pretty smooth, woolly underneath; about half an inch long. *Flowers* collected in the axills of the leaves, short-peduncled. *Calyx* tomentose on the outside. *Petals* short-clawed, oval. *Stigma* two-cleft.

14. Z. *Napeca. Willd. spec.* i. 1104.

Shrubby, climbing. *Leaves* obliquely cordate, serrate, three-nerved, downy underneath.
I. *Thorns* stipulary. *Nuts* two-celled.
614 *Sans.* Sookshmuphula, Buhookuntuka, Sookshmuputruka, Doospursha, Mudhoora, Shuvurahara, Shikhipriya, Kurkundhoo, Shrigalukoli.

Beng. Shea-kool.

Telinga. Paramie.

This is the most common species of the genus; it is to be found in every hedge throughout India, and always with scarcely any thing that can be called a trunk, but many large, straggling, climbing branches, which are too weak to support themselves. *Bark* dark, rust-coloured, pretty smooth; *young shoots* downy. *Prickles* always present, stipulary, large, and exceedingly sharp; the lower one is much recurved, the upper one straight. *Leaves* alternate, short-petioled, bifarious, very obliquely ovate, serrate, three-nerved; downy underneath, from one to two inches long. *Corymbs* axillary, many-flowered. *Style* two-cleft. *Drupe* the size of a pea, smooth, shining black, marked round the base with a circular scar. *Nut* rugose, obcordate, two-celled; generally one of the cells is obliterated, or abortive. *Seed* solitary, affixed to the bottom of the cell.

The fruit is eaten by the natives; the taste a very pleasant acid. A decoction of the bark of the fresh root is said to promote the healing of fresh wounds.

15. Z. *glabra. R.*

Shrubby, scandent, smooth. *Thorns* solitary, recurved. *Leaves* ovate-cordate, long, obtuse, pointed, serrulate, smooth, strongly marked with three nerves. *Drupes* oval.

A native of Chittagong, where it flowers in the cool season, and the fruit, which is about the size of a gooseberry, ripens in May.

16. Z. *incurva. R.*

I. Arboreous. *Thorns* paired, one straight and patent, the other incurved. *Leaves* ovate-
615 oblong, polished, three-nerved, serrulate; obtusely acuminate. *Peduncles* axillary, few or many-flowered; *flowers* semi-digynous.

A native of Nepal, from thence introduced by Dr. Buchanan into the Botanic garden at Calcutta, in 1802, where in ten years they had grown to be slender trees, of about fifteen feet in height, with innumerable well armed branches, and smooth branchlets spreading in every direction. Flowering time the rainy season.

CEANOTHUS. Linn.

Petals five, vaulted, opposite to the stamens. *Berry* dry, three-celled, three-seeded.

1. C. *asiatica. Linn.*

Pag
Carey
Ed.

Erect, smooth. *Leaves* ovate, serrulate, glossy, tri-nerved at the base; *peduncles* axil lary, ramous, many-flowered, shorter than the leaves.

Grossularia spinis vidua, baccis in racemo congestis spadiceis, foliis crenatis ovato-acuminatis. *Burm. Zeyl.* 111. *t.* 48.

Rhamnus acuminata. Colebr. Mss. fide. ic. pict. in horto bot. Calc. asservata.

I have found this small tree in flower and fruit in October at Singapore. In the Honourable Company's Botanic garden, where it was introduced from the garden at Reduite in the Mauritius in 1813, it blossoms in April and May, and ripens its fruit in June.

A small branchy tree or large shrub: the largest of those that were reared from the seeds measure at the present time (1823), about sixteen feet in height, with a stem scarcely more than four inches in diameter. *Branches* long, slender, round, with green bark, slightly flexuose, perfectly smooth; while young a little pubescent. *Leaves* irregularly scattered, ovate, or ovate-lanceolate, tapering into a blunt acumen; serrulate, serratures small, gibbous, incurved, I.
cuspidate, slightly undulate, base rounded or retuse, from two or three inches long; perfectly 616
smooth, very glossy and lucid, of a dark green colour above; pallid and shining underneath, with a whitish slender rib and a few oblique nerves, the lowermost pair of which are opposite; the base rising a little above the rib, in consequence of which the leaf appears triple-nerved; veins capillary, transversal, reticulate. *Petiole* slender, a little compressed, channelled, slightly pubescent, about an inch long. *Stipules* minute, withering, adpressed, lanceolate, with a broad fleshy base and glandular apex. *Flowers* small, yellowish green, fragrant, collected in rounded, axillary, ramous fascicles which are shorter than the petals. *Peduncles* pubescent; *bractes* very small; *pedicels* capillary, two or three times longer than the flower, yellowish. *Calyx* cup-shaped, with five broad, cuspidate, somewhat margined, deciduous *laciniæ*, equalling in length the cuneate, fornicate, narrow petals. Vertex of the ovary covered with a broad rugose yellow disc. *Style* short, deeply three-lobed, deciduous. *Stigmas* convex, scabrous. *Capsules* round-obovate, about the size of a small gooseberry, pale-brown, its vertex retuse, its base supported by the persistent circularly-truncate bottom of the calyx, three-furrowed, three-celled, three-valved. *Seeds* triangular, with gibbous back, ash-coloured. The rest as in C. *circumscissa* (*Rhamnus* Linn.) *Gært. carp.* ii. 110. *t.* 106.

SCOPOLIA. Smith.

Calyx five-toothed. *Corol* five-petalled. *Germ* superior, five-celled; *cells* two-seeded; *attachment* interior. *Berry* five-celled, with generally one seed in each cell.

1. S. *aculeata. Smith. ic. ined.* ii. 34. *Willd. sp.* i. 1115.

Scandent, armed. *Leaves* ternate; *leaflets* crenulate.

Paullinia *asiatica. Linn. sp. pl.* 524.

Kaka-toddali. *Rheed. Mal.* v. 81. *t.* 41. I.

Chamaelaea trifolia, aculeata, floribus spicatis. *Burm. Zeyl.* 58. *t.* 24. 617

Toddalia. *Juss. gen.* 371; and *Lamarck Illustr.* ii. 116. 2757. *Encycl. Bot.* vii. 692.

Cranzia. *Schreb. gen. N.* 362.

Telinga. Conda Cashinda.

Is one of the most common bushes on the coast of Coromandel, delights in a rich soil, such as old hedges, under old trees, &c. is in general found in the state of a very ramous bushy shrub, but in less frequented places, where it meets with support and no enemies, it runs over the highest trees.

Stem irregular. *Bark* corky. *Branches* exceedingly numerous, scandent. *Prickles* innumerable, scattered over every part of the younger branches, tender shoots, petioles, and nerves of the leaflets, recurved, very acute. *Leaves* alternate, ternate, armed. *Leaflets* oblong, or broad-lanceolate, notched, emargined, smooth; about an inch and a half long, and half or three-fourths broad. *Petioles* channelled, armed like the branchlets. *Racemes* axillary, generally compound, length of the leaves. *Flowers* small, white. *Calyx* inferior, small, glandular, five-toothed. *Petals* five, oblong, spreading. *Filaments* five, nearly as long as the petals, spreading. *Anthers* oblong, incumbent. *Germ* ovate, five-celled, with two ovula in each, attached to the middle of the axis. *Style* short, thick. *Stigma* five-lobed. *Berry* the size of a small cherry, compressed, five-grooved, orange-coloured, five-celled. *Seed* one in each cell.

Every part of this shrub has a strong pungent taste. The roots when fresh cut smell particularly so. The fresh leaves are eaten raw for pains in the bowels; the ripe berries are fully as pungent as black pepper, and with nearly the same kind of pungency; they are pickled by the natives, and a most excellent one they make.

The fresh bark of the root is administered by the Telinga physicians for the cure of that I.
sort of remittent, commonly called the hill fever. I conceive every part of this plant to be 618
possessed of strong, stimulating powers, and have no doubt but under proper management it might prove a valuable medicine where stimulants are required.

BÜTTNERA. Schreb. gen. N. 366.

Calyx five-leaved. *Corol* five-petalled. *Nectary* staminiferous, surrounding the five-celled superior germ. *Anthers* double. *Capsules* quinquecoccea. *Embryo* inverse; perisperm scanty.

1. B. *pilosa. R.*

Page Carey Ed.

Shrubby, twining, hairy. *Leaves* from three to five, acute-angled, dentate. *Umbels* axillary, proliferous.

A most extensive, twining shrub; a native of Chittagong. The flowering time in the Botanic garden at Calcutta is September. The seeds are ripe in April. I have also had specimens from Silhet.

Stem woody, twining, in five years old plants as thick as a man's wrist, and irregularly obtuse-sulcate. *Branches* numerous, twining up and over large trees, to a very great extent; the younger ones very hairy, and irregularly obtuse-sulcate. *Leaves* alternate, petioled, having from three to five acute angles, dentate, posterior lobes large and rounded; about seven-nerved, with a large, long gland on the middle one near the base, from four to six inches each way. *Petioles* round, often as long as the leaves, hairy. *Stipules* subulate, hairy. *Umbels* axillary, generally one large, and super-decompound; and two or more smaller, all are clothed with short, harsh pubescence, and are much shorter than the leaves. *Bractes* subulate. *Flowers* numerous, small. *Calyx* of five, spreading, pale-coloured, lanceolate leaflets. *Petals* five; the lower third part of their length linear, yellow on the outside, and

I. 619 red within; much incurved so as to form a circular dome over the pistil and nectary, open at the five sides, and in the vertex, the other two-thirds filiform, below slightly incurved, above recurved; colour a bright orange. *Nectary* five-cleft, yellowish, divisions fleshy, truncate, shorter than the lower portion of the petals. *Filaments* short, inserted into the fissures of the nectary, recurvate. *Anthers* two-lobed. *Germ* round, hairy. *Style* short, five-grooved, *Stigma* minutely quinquidentate. *Capsules* the size of a filbert, round, armed with long, rigid bristles; texture hard, approaching to that of a nut, five-celled, ten-valved. *Seeds* solitary, small in proportion to its cell, and attached to its inner angle, ovate-oblong, rather pointed at the apex, and obliquely truncate at the base. *Integuments* three; the *exterior* and *interior* membranaceous; the middle one hard and thick. *Perisperm* none, or very thin. *Embryo* inverse, yellow. *Cotyledons* large, two-lobed; and rolled spirally up. *Plumula* two-lobed. *Radicle* cylindric, nearly as long as the seed, superior.

2. B. *herbacea. Roxb. Corom.* i. *N.* 29.

B. cordata. Willd. spec. i. 1119

Unarmed, herbaceous, erect. *Leaves* cordate, serrate, downy. *Nectary* one-leaved, five-toothed.

An erect herbaceous plant, a native of the tops of the Circar mountains.

Leaves alternate, petioled, cordate, serrate, downy, two inches and a half long, and one and a half broad. *Stipules* reflexed, small, acute. *Peduncles* axillary, one or more, three-flowered. *Leaflets* of the calyx large, reflexed. *Nectary* one-leaved, five-toothed; teeth converging over the pistillum. *Filaments* five, very short, from the fissures of the nectary, reflexed. *Anthers* double; singly oval.

CELASTRUS. Schreb. gen. N. 372.

I. 620 *Calyx* five-cleft. *Corol* five-petalled. *Germ* three-celled, with two or more ovula in each cell; *attachment* inferior. *Capsule* superior, from one to three-celled, from two to three-valved; *seeds* few covered with a coloured aril. *Embryo* erect, and furnished with a perisperm.

1. C. *emarginata. Willd. sp.* i. 1128.

Shrubby, armed. *Leaves* obovate, entire, smooth. *Flowers* numerous, axillary. *Capsules* inflated; *cells* two-seeded.

Telinga. Chennee Chintoo.

Is one of the most common, rather poor looking shrubs in these parts of India, it grows every where and in every soil. Flowers during the cold season.

Stem nothing deserving the name, but branches innumerable, bent in every direction, and armed with exceedingly strong, large, straight, very sharp thorns. *Leaves* alternate on the *young shoots*, on the old wood or thorns fascicled, very short-petioled, obovate, emarginate, smooth, shining; about an inch long. *Stipules* small, withering. *Umbellets* very short-peduncled, many-flowered, one or two from the centre of the fascicles of leaves. *Pedicels* many times longer than the peduncle, one-flowered. *Flowers* small, whitish, yellow. *Petals* twice the length of the calyx. *Nectary*, a saucer-formed, crenulate body surrounding the base of the germ. *Germ* conical, three-celled, two *ovula* in each, attached to the bottom of their cell. *Style* single, half three-parted. *Stigmas* emarginate. *Capsule* inflated, turbinate, three-sided, three-celled, valved. *Seeds* two in each cell, small, shining, red, resting on a white fleshy receptacle.

It makes good fences, and fuel.

2. C. *montana. R.*

Arboreous, thorny. *Leaves* obovate, serrulate, smooth. *Panicles* axillary, small, dichotomous. *Capsules* with cells two-seeded.

Telinga. Pedda-chintoo.

I. 621 A small tree, a native of mountains. Flowering time the cold season.

Trunk erect, though generally a little crooked. *Branches* numerous, armed with the same large, sharp leaf and flower bearing thorns as in the last. *Leaves* alternate, short-petioled, obovate, slightly serrate, smooth, shining; about two inches long. *Panicles* axillary, dichotomous, many-flowered. *Flowers* small, white. *Petals* many times longer than the calyx. *Nectary* as in C. *emarginatus*. *Germ* round, three-celled; *cells* with two ovula in each, attached to the bottom of the cell. *Styles* three, short, clubbed. *Stigmas* emarginate. *Capsules* small, not inflated, in other respects like the last. *Seeds* one or two in each

cell, small, nearly round, attached as in the germ. *Aril* white, sebaceous, embracing the lower half of the seed. *Integument* single, polished, brown. *Perisperm* conform to the seed, dull white, and hard. *Embryo* nearly as long as the perisperm, erect. *Cotyledons* roundish. *Radicle* ovate, inferior. Page Carey Ed.

The wood of this tree is hard, and durable.

3. C. *paniculata. Willd. sp.* i. 1125.

Unarmed, shrubby, scandent. *Leaves* round, oval, serrate. *Panicle* terminal. *Stamens* inserted into a nectarial ring.

A large, climbing shrub; a native of the Circar mountains. Flowering time March and April.

Branches twiggy. *Bark* covered with gray, scabrous specks. *Leaves* alternate, petioled, broad-oval, serrate, pretty smooth, about two inches long, and one and a half broad. *Petioles* round, and one-third the length of the leaves. *Panicles* terminal, erect, thin, oblong. *Bractes* small, falling. *Flowers* small, yellow, numerous. *Calyx* inferior, five-toothed; *segments* concave, emarginate. *Petals* five, inserted between the nectary and calyx, spreading. *Nectary* cup-shaped; border five-toothed. *Filaments* five, which are a continuation of the teeth of the nectary, rather shorter than the petals. *Anthers* ovate. *Germ* round. *Style* shorter. *Stigmas* three. *Capsule* round, size of a pea, one-celled, three-valved, opening from the apex. *Seeds* from three to six, surrounded with a yellow pulpy nidus, and always separating into three lobes, whatever the number be. I. 622

4. C. *multiflora. R.*

Shrubby, scandent, unarmed. *Leaves* alternate, oblong, acuminate, serrate. *Panicles* terminal. *Stamens* alternate, with an equal number of reniform nectarial glands.

A native of Nepal, from thence Dr. Buchanan sent the seeds to the Botanic garden at Calcutta, in 1802. In July 1808, the plants therefrom blossomed for the first time and ripened their seed seven months afterwards.

Trunk short, about as thick as a man's arm. *Bark* brown, soft and spongy. *Branches* numerous, spreading much, and having their extremities often twining, but the scandent habit prevails most. *Leaves* alternate, short-petioled, drooping, oblong, acuminate, serrate, smooth on both sides; about six inches long, and from two to three broad. *Stipules* minute, soon withering and drooping. *Panicles* terminal, ovate-oblong, composed of many, simple, diverging, short, smooth racemes. *Flowers* numerous, small, pale greenish white. *Bractes* very small, caducous. *Calyx* obscurely five-toothed. *Petals* oblong, inserted on the calyx, alternate with the stamens, soon after expansion recurved. *Filaments* shorter than the petals, alternate, with as many semi-lunar nectarial glands. *Germ* superior, ovate, three-celled, with two ovula in each, attached to the bottom of the cells. *Style* about as long as the stamens. *Stigma* of three emarginate lobes. *Capsule* roundish, somewhat three-lobed, three-celled, three-valved, and generally with a single seed in each cell. *Seeds* obovate, entirely covered by a thin, pulpy, scarlet aril. *Integuments* (exclusive of the aril), single, tender, white and smooth. *Perisperm* of a soft cartilaginous texture. *Embryo* erect. *Cotyledons* two, round-cordate, and so large as to divide the perisperm. *Radicle* inferior, pointing obliquely to the umbilicus. I. 623

5. C. *nutans. R.*

Shrubby, scandent, unarmed. *Leaves* alternate, petioled, broad-obovate, obtusely serrate, smooth. *Panicles* racemose, terminal. *Seeds* invested in a complete aril.

A native of Mysore, from thence introduced by Dr. Buchanan, into the Botanic garden at Calcutta, where it flowers in April. Seeds ripe in August.

Stem short, round, woody, scandent. *Bark* a little scabrous, light brown. *Branches* climbing and twining over the tops of large trees, &c.; *young shoots* round, drooping, marked with white, rough dots. *Leaves* alternate, short-petioled, drooping, broad, obovate, cuneate, serrate, smooth on both sides; length from two to three inches, and from one to three broad. *Petioles* about half an inch long, slightly channelled. *Stipules* minute, deciduous. *Racemes* or *panicles* terminal, drooping, sub-cylindrical, a little downy. *Bractes* a single, acute, very small, caducous one at the base of each pedicel. *Calyx* deeply five-parted, divisions roundish, slightly pubescent, several times shorter than the petals. *Petals* five, alternate with the divisions of the calyx, spreading; margins becoming recurved. *Nectary* a concave, five-sided receptacle, on which the germ rests. *Filaments* five, very short, inserted on the five angles of the nectary, alternate with the petals. *Anthers* sub-sagittate. *Germ* ovate, three-lobed, three-celled, with two *ovula* in each, attached to the base of the axis. *Style* scarcely any. *Stigma* three-lobed, lobes spreading, with notched margins. *Capsule* round, size of a pea, one-celled, three-valved. *Seeds* from three to six; three or four is the most common number; shape conform to the number, each invested in a thick, complete, fleshy, orange-coloured aril. *Integument* single. *Perisperm* conform to the seed, white and hard. *Embryo* straight, erect, green. *Cotyledons* oblong. *Radicle* cylindric inferior, with its apex pointing to the umbilicus. I. 624

Obs. There are five or six large plants of this in the Botanic garden, of these one only is hermaphrodite and fertile, all the rest are male, or male-hermaphrodite, and barren.

6. C. *trigyna. R.*

Unarmed. *Leaves* alternate, short-petioled, oblong, entire. *Flowers* on small, axillary, dichotomous, round heads. *Nectary* of five scales, alternate in the stamen. *Styles* three.

A native of the Moluccas.

7. C. *verticillata. R.*

Arborescent, unarmed. *Leaves* scattered, broad-lanceolate, waved, entire, smooth. *Pani-*

Page Carey Ed. *cles* terminal, umbelliferous. *Capsules* one-celled, two-valved, few-seeded.

Reared in the Botanic garden at Calcutta from seeds sent from Nepal by Dr. Buchanan in 1802, under the vernacular name *Tibiliti*. The young trees flowered for the first time, in the rainy season of 1805, when they were from twelve to fifteen feet high. The seeds ripen in January.

Trunk straight; the branches and branchlets have a strong tendency to be verticillate. *Bark* of the trunk, and larger branches greenish ash-coloured, dotted with some small, elevated, lighter-coloured specks. *Leaves* numerous, drooping, scattered, more crowded towards the ends of the branchlets, and like them having a tendency to be verticillate, petioled, broad-lanceolate, acute, entire; *margins* waved, smooth, upper surface polished; about six inches long, by two broad. *Petioles* rounded on the under side, flattish above. *Stipules* none. *Panicles* terminal, with alternate, spreading, umbelliferous, simple ramifications. *Peduncles* and *pedicels* round, and smooth. *Bractes* lanceolate. *Calyx* five-leaved. *Leaflets* ovate-oblong, slightly ciliate. *Petals* five, alternate with, and three times longer than the leaflets of the calyx, linear-oblong, entire, obtuse, at first spreading, afterwards
I. recurved, with the edges revolute. *Germ* ovate-oblong, a little compressed, two, rarely
625 three-celled. *Style* erect, permanent. *Stigmas* two, rarely three-lobed, about even with the anthers. *Capsules* roundish, size of a large pea, dry, rugose, one-celled, two-valved, opening round the apex. *Seeds* from one to six, or even eight, attached to the centre of a ridge in the bottom of the cell, which crosses the opening of the valves; their shape varies according to the number of seeds. *Integument* single, and while fresh more like a thin, smooth, soft, moist, entire, scarlet aril, than a common skin. *Perisperm* conform to the seed, cartilaginous. *Embryo* erect, minute, lodged in the base of the perisperm, rather below the umbilicus. *Cotyledons* two, very small. *Radicle* inferior, oval.

8. C. *micrantha*. *R.*

Scandent, somewhat armed. *Leaves* unequally pinnate; leaflets from five to seven, opposite, oblong, entire, smooth, with simple parallel veins. *Panicles* axillary, filiform, ferruginous. *Nectary* saucer-shaped, bearing the stamina on its margins, style none.

A native of the Moluccas, a very doubtful species.

9. C. *obtusifolia*. *R.*

Arboreous, unarmed. *Leaves* petioled, lanceolar, obtusely serrulate, very obtuse, hard, smooth. *Peduncles* axillary, many-flowered.

A native of the Mauritius.

10. C. *monosperma*. *R.*

Shrubby, scandent. *Leaves* oblong, glossy, serrulate. *Panicles* thin, linear, axillary and terminal, longer than the leaves. *Capsules* three-valved, one-seeded.

Tiara the vernacular name in Silhet, where it is found wild in thin forests, climbing up and over trees, &c. to a great extent. Flowering time the month of April. Seeds ripe in October.

I. *Young shoots* smooth and brown, perfectly void of every kind of pubescence. *Leaves* al-
626 ternate, short-petioled, from obovate-oblong to lanceolar, glossy on both sides, serrulate, obtusely pointed, from three to five inches long, and one or two broad. *Panicles* axillary and terminal, linear, thin of branches, two, three, or even four times longer than the leaves, smooth. *Flowers* numerous, small, pale greenish yellow. *Bractes* subulate, small, smooth. *Calyx* five-parted, segments short and rounded. *Petals* five, sub-orbicular, inserted, alternate with the stamens under the margin of the flat repand nectary, which embraces the base of the germ. *Filaments* five, short. *Anthers* oval. *Germ* obovate, oblong, three-celled, with two ovula in each attached to the bottom of the cell. *Style* short. *Stigma* trigonal. *Capsule* the size of a field bean, oblong, smooth, three-valved, but I never found more than one cell. *Seed* solitary, covered with an orange-coloured, pulpy tunic, under it a single, tender integument, of a light brown colour. *Perisperm* conform to the seed, pure white. *Embryo* erect, deep green. *Cotyledons* oblong. *Radicle* oval, inferior.

11. C. *robustus*. *R.*

Leaves alternate, lanceolar, entire, glossy. *Racemes* axillary, length of the leaves. *Capsule* one-celled, two-seeded.

Sheelkoil the vernacular name in Silhet, where it is indigenous and grows to be one of their largest timber trees. It blossoms in August, and the seeds ripen in March.

Young shoots straight, round, and smooth. *Leaves* alternate, petioled, lanceolate, entire, acuminate, firm, and even glossy; about six inches long, and one and a half or two broad. *Stipules* small, caducous. *Racemes* axillary, single, or paired, simple, cylindric, length of the leaves. *Flowers* numerous, and over every part of the raceme, small, greenish yellow. *Bractes* conical, one under each pedicel. *Calyx* five-parted; *segments* oblong. *Petals* five, oblong, spreading. *Nectary*, a fleshy, five-lobed ring round the base of the germ. *Filaments* five, rather
I. longer than the petals. *Anthers* two-lobed. *Germ* superior, round, with a little long white wool
627 on the apex, two-celled, with two ovula in each attached to the base of the cell. *Styles* two; slightly united at the base, recurved. *Stigmas* headed. *Capsules* ovate-oblong, size of a small olive, smooth, brown, one-celled, two-valved. *Seeds* generally two; when so lanceolate, and flat on the inner side, arilled. *Integuments* smooth, light chesnut-colour, pretty thick and may while recent be divided in two or three lamina; *aril* complete within half a line of the apex, thick and soft, colour a lively bright yellow. *Perisperm* conform to the seed, soft, white. *Embryo* erect. *Cotyledons* cordate. *Radicle* cylindric, as long as the cotyledons, inferior.

EUONYMUS. Schreb. gen. N. 373.

Corol from four to five-petalled. *Germ* from two to five-celled; *cells* two-seeded; *attach*

ment inferior. *Capsule* superior, three or four-celled, three or four-valved. *Seeds* calyptred. *Embryo* erect, and furnished with a perisperm. Page Carey Ed.

1. E. *atropurpurea. Willd. spec.* i. 1132.

Shrubby, erect. *Leaves* opposite, lanceolar, smooth, serrulate. *Peduncles* few-flowered; *flowers* tetrandrous.

Found by Dr. Buchanan in Nepal, from whence he sent seed to this garden, where in eight years the plants are four or five feet high, thin of branches; and now beginning to blossom in March.

Trunk erect. *Bark* smooth, and ash-coloured. *Branchlets* spreading, round, and smooth. *Leaves* opposite, short-petioled, lanceolar, smooth on both sides, very finely serrulate, from four to six inches long, by one and a half broad. *Stipules;* while the shoots are quite tender a small soft bristle or two occupy their place. *Peduncles* below the leaves, opposite, expanding, dichotomous, each division three-flowered, with generally one in the fork. *Flowers* pedicelled, small, greenish white. *Calyx* four-leaved; *leaflets* round, concave and smooth. *Petals* four, cordate, lanceolate, expanding; margins revolute, white, and smooth. *Nectary* a deep green, four-lobed, fleshy body surrounding the base of the germ. *Filaments* four, rather longer than the pistillum, inserted on the four lobes of the nectary. *Anthers* two-lobed, dark brown. *Germ* superior, four-lobed, four-celled, with two ovula in each, attached to the middle of the axis. *Style* four-sided. *Stigma* obtuse. I. 628

2. E. *glabra. R.*

Arboreous. *Leaves* opposite, oblong, smooth, with the anterior margin serrate. *Peduncles* axillary and lateral, two or three times dichotomous, with a single flower in each fork; *flowers* pentandrous.

A small tree, a native of Chittagong, where it flowers in May.

3. E. *garcinifolia. R.*

Sub-arboreous. *Leaves* opposite, lanceolar, entire, smooth. *Peduncles* between the leaves, three-flowered. *Capsule* two-valved, one-seeded.

Mori the vernacular name in Silhet, where it is indigenous; growing to the size of a small upright tree; flowers and ripe seed were found on the same trees in the month of January 1812, but whether it is in constant flower and fruit the whole year round, I cannot say.

Branchlets opposite, round, and covered with smooth brown bark. *Leaves* opposite, short-petioled, lanceolar, entire, smooth on both sides; from three to four inches long, by about one broad. *Peduncles* between the pairs of leaves, sometimes opposite, sometimes solitary, short, and three-flowered. *Flowers* short-pedicelled, small, pale-yellow. *Bractes* subulate, caducous. *Calyx* five-leaved; *leaflets* roundish, smooth and imbricated. *Petals* five, oblong, margins incurved, many times longer than the calyx; down the middle on the inside runs an elevated sharp rib. *Filaments* five, shorter than the germ, alternate with the petals. *Anthers* erect, long-cordate. *Germ* superior, ovate, two-celled; each cell containing two ovula, attached to the thickened middle of the partition. *Style* none, or very short. *Stigma* four-toothed. *Capsule* oblong, size of a small field bean, smooth, one-celled, two-valved, opening from the base. *Seeds* solitary, at least I have not found more, oval, covered with a thin, succulent, veined, bright, scarlet aril. *Perisperm* conform to the seed, firm, and tough. *Embryo* erect. *Cotyledons* ovate-cordate. *Radicle* cylindric, inferior. I. 629

VENTILAGO. Gœrt.

Calyx five-parted. *Corol* five-petalled. *Germ* hid in the crenulated flat nectary. *Style* two-cleft. *Samara* semi-supera, globose, long-winged, one-seeded. *Embryo* erect, with perisperm.

1. V. *Madraspatana. Willd. sp.* i. 1106. *Gœrt. carp.* i. 223. *t.* 49.

Funis viminalis. *Rumph. Amb.* v. 3. *t.* 2.

Beng. Ruktupita.

Telinga. Yerra chictali.

A very large climbing shrub; a native of forests and other uncultivated places, amongst the mountains; flowering during the cold season.

Leaves alternate, short-petioled, bifarious, ovate-oblong, serrulate, smooth, except while young, then villous; from three to four inches long. *Panicles* terminal, composed of alternate, bifarious, ramous, villous branches. *Flowers* very numerous, small, greenish, smelling very strong and offensive. *Calyx, corol, nectary, stamens,* and *pistillum* as in *Rhamnus Jujuba. Capsule (Samara)* globular, size of a pea, surrounded near the middle with the remaining nectary, terminating in a long, linear, membranaceous wing, one-celled, not opening of itself. *Seed* solitary, round. I. 630

Obs. This plant is generally dioicous. The smell of the flowers is very offensive, not unlike that of *Sterculia fœtida.*

HOVENIA. Schreb. gen. N. 375.

Calyx five-parted. *Corol* five-petalled. *Germ* superior, three-celled; *cells* one-seeded; *attachment* inferior. *Style* three-cleft. *Capsule* tricoccous. *Embryo* erect, with scanty perisperm.

1. H. *dulcis. Thunb. japon.* 101. *Willd. spec.* i. 1141.

Sicku, vulgò *Ken et Kenpokonas, Kaempf. amoen. p.* 808. *t.* 809.

A tree, a native of Nepal; from thence introduced by Dr. Buchanan into the Botanic

Page Carey Ed. garden at Calcutta, where when eight years old, it began to blossom in April.

Trunk in our young trees straight and high, from ten to twelve feet to the branches; and twenty inches in circumference, four feet above the earth. Total height about thirty feet. *Bark* smooth, dark-brown. *Branches* spreading much, branchlets bifarious, round; *young shoots* hairy. *Leaves* alternate, short-petioled, cordate, acutely serrate, acuminate, three-nerved, smooth above, a little hairy underneath; from four to six inches long, by from two to four broad. *Stipules* lanceolate, hairy, caducous. *Cymes* axillary, rarely terminal, dichotomous, villous; *divisions* clavate. *Flowers* numerous, small, white. *Calyx* one-leaved, acetabuliform, inside hairy. *Border* five-parted; *divisions* ovate, reflexed. *Petals* five, inserted within the fissures of the calyx, broad spatulate, sides incurved round the filaments. *Filaments* five, longer than the petals, recurved. *Anthers* ovate. *Germ* superior, ovate, three-celled, with one ovulum in each, attached to the bottom of its cell. *Style* cylindric, apex three-cleft. *Stigmas* simple. *Capsules* superior, round, size of a pea, thin, smooth, and
I. brown, three-celled. The ramifications of the cyme are now, when the seeds are ripe, much
631 swollen, and variously bent, as represented by Kaempfer, but the taste is simply astringent. *Seed* solitary. *Integuments* two; *exterior* tough, thick, hard, and highly polished; *interior* membranaceous, and covered with a brown mealy substance. *Perisperm* in small quantity, tough, dull, livid-white. *Embryo* erect, yellowish. *Cotyledons* orbicular. *Radicle* oval, inferior.

Obs. By Dr. Buchanan, dated Katumanda, 10th and 14th November, 1802. "Munkokoshee. A tree originally brought from China or some country subject to it. The fruit is a capsule, containing three seeds, and resting on an enlarged peduncle, which is soft, and contains a sweet juice. This does not come to maturity till after the capsules are ripe. Part of the seed now sent in this parcel was brought from China, and part has ripened here. There can be no doubt, from the singular nature of the peduncle, that it is an *Hovenia, Thunb.* But whether or not his species, I know not. It has hairy leaves and is reckoned the largest tree in Nepal."

PITTOSPORUM. Schreb. gen. N. 379.

Calyx five-leaved, deciduous. *Petals* five: *germ* superior, three-celled: *cells* many-seeded; *attachment* interior. *Capsule* three-celled, three-valved. *Seeds* many. *Embryo* centripetal, and furnished with a perisperm.

1. P. *Tobira. R.*

Leaves sub-verticelled, obovate, cuneate, entire, and lucid, apex circular.

Tobira *Kaempf. amoenit.* 796. *tab.* 797.

From China this pretty shrub has been introduced into the Botanic garden at Calcutta.

GOUANIA. Schreb. gen. N. 1592.

I.
632 *Calyx* five-parted. *Corol* five-petalled. *Germ* three-celled, sunk in the saucer-shaped, five-horned nectary; *cells* one-seeded; *attachment* inferior. *Capsule* inferior, three-celled, with a single seed in each. *Embryo* erect, and furnished with a perisperm.

1. G. *tiliæfolia. Willd. sp.* iv. 1000. *Roxb. Corom.* 1. *N.* 98.

Shrubby, climbing. *Leaves* cordate, serrulate, smooth. *Racemes* terminal, and axillary. *Telinga.* Penki-tiga.

A large, climbing, woody shrub, a native of the Circar mountains.

Tendrils simple, small, generally from the lower part of the racemes. *Leaves* alternate, petioled, cordate, slightly serrate, or crenulate, smooth, from two to four inches long. *Racemes* terminal, and from the exterior axills, long, filiform. *Flowers* numerous, small. *Bractes* minute. *Calyx* above, five-parted. *Corol* as in Rhamnus. *Nectary* the saucer-shaped part is here augmented by five emarginated, spreading horns. *Filaments* inserted in the margin of the nectary, alternate with its horns. *Germ* below, three-sided. *Style* three-cleft. *Capsule* dry, triangular, three-celled, three-valved. *Seeds* one in each cell.

ITEA. Schreb. gen. N. 381.

Calyx five-toothed. *Petals* five, (four of which, with the stamina are inserted on the receptacle.) *Capsule* one-celled, two-valved, many-seeded. *Receptacles* lateral.

1. I. *umbellata. R.*

Shrubby. *Leaves* alternate, petioled, broad-lanceolate. *Panicles* axillary, and terminal, composed of long-pedicelled, simple umbellets.

I. A native of the Malay Islands.

633 *Leaves* alternate, petioled, broad-lanceolate, entire, smooth, from six to twelve inches long. *Petioles* from one to two inches long. *Stipules* one. *Panicles* axillary, terminal, and scattered amongst the leaves, composed of long-pedicelled umbellets, which are sometimes proliferous. *Flowers* numerous, pretty large. *Bractes* minute, villous. *Calyx* cup-shaped, five-toothed. *Petals* five, lanceolate, obtuse, inserted, with the stamina round the base of the germ. *Filaments* shorter than the corol, flat. *Anthers* sagittate. *Germ* oblong, pedicelled, containing many ovula, attached to two opposite, parietal receptacles. *Style* short and thick. *Stigma* slightly two-lobed. *Capsule* oblong, one-celled, two-valved. *Seeds* several, affixed to the two parietal receptacles.

DALRYMPLEA. Roxb.

Page Carey Ed.

Calyx five-leaved. *Petals* five, alternate with the stamina. *Germ* superior, three-celled; *cells* many-seeded; *attachment* of the ovula inferior. *Berry* three-celled. *Seeds* few, nuciform. *Embryo* sub-inferior, and furnished with a perisperm.

In memory of the late Alexander Dalrymple, Esq. author of the *Oriental Repertory*, &c.

1. D. *pomifera. R.*

Junki jam the vernacular name in Silhet where it is a native, and grows to be a large tree. Flowering in March, and the seed ripening in September and October.

Young shoots rather succulent, round, and perfectly smooth. *Leaves* opposite, unequally pinnate, some of them ternate; from ten to twenty inches long. *Leaflets* three or four pair, and a terminal one, the pairs opposite, all more or less petiolate, oblong, obtusely serrate, acuminate, smooth, from five to six inches long, by two or three broad. *Petioles* and *petiolets* round and smooth. *Panicles* terminal, spreading much, more broad than long, primary branches decussate; partial ones alternate with the small yellowish white flowers, which are crowded round their extremities; every part smooth. *Bractes* to the primary branches of the panicle opposite, as in the *Rubiaceæ*; the rest solitary under each division and sub-division. *Calyx* inferior, five-leaved; *leaflets* rather unequal and oval. *Petals* five, oblong, obtuse, spreading. *Nectary* acetabuliform. *Filaments* five, alternate with the petals, and shorter than they, inserted under the nectary. *Anthers* ovate. *Germ* superior, three-lobed, indeed almost separable, three-celled; *ovula* about eight in each cell, widely attached to the axis. *Style* length of the germ, three-grooved. *Stigma* three-lobed. *Berry* drupaceous, having the appearance of a pome, of a roundish, three-lobed form, very fleshy, when ripe yellow, and almost smooth, size of a large medlar, three-celled. *Seeds* several in each cell, shape various, the most common roundish, reniform and considerably compressed, attached to the partition. *Integument* single, thick and of great hardness, in fact a perfect nut, exterior surface brown and highly polished. *Perisperm* conform to the seed. *Embryo* obliquely inferior. *Cotyledons* cordate, three-nerved. *Radicle* oval, obliquely centrifugal. I. 634

CEDRELA. Schreb. gen. N. 383.

Calyx five-toothed. *Corol* five-petalled. *Capsules* five-celled, five-valved. *Seeds* several in each cell, winged and imbricated on a pentagonal receptacle. *Embryo* inverse, perisperm scanty.

This genus is very nearly related to *Swietenia*, the chief marks of distinction appear to me to be the number of stamina, viz. in *Cedrela* five, inserted on five nectarial glands which embrace the base of the germ; in *Swietenia* ten, inserted into the mouth of a sub-cylindrical nectarium, which embraces the whole of the pistillum. In both, the seed vessels and seeds are very exactly alike.

1. C. *Toona. R.* I. 635

Panicles pendulous. *Leaflets* from six to twelve pairs, lanceolate, entire, acute.

Surenus. *Rumph. Amb.* iii. 66. *t.* 39.

Beng. Toon. Lood.

This most elegant, large timber tree is now found common in Bengal, probably brought thither originally from the mountainous parts of the northern, and north-east frontier. *Leaves* deciduous during the cold season, appearing again with the flowers in February. *Seed* ripe in May and June.

Trunk erect, growing to a great size and height, though I have only seen small trees about Calcutta. *Bark* smooth, gray. *Branches* numerous, forming a large, beautiful, shady head. *Leaves* alternate, abruptly pinnate, drooping, from twelve to eighteen inches long. *Leaflets* from six to twelve pairs, opposite or nearly so, short-petiolated, obliquely lanceolate, the upper half broadest, and extending further down the petiolet than the lower; margins waved, smooth on both sides, tapering to a long acute point; from two to six inches long. *Petioles* and *petiolets* round and smooth. *Stipules* none. *Panicles* terminal, nearly as long as the leaves, pendulous, composed of numerous, diverging, compound ramifications, smooth in every part. *Bractes* minute, deciduous. *Flowers* very numerous, small, white, and possessing a fragrance like that of fresh honey. *Calyx* five-parted. *Petals* five, oblong, with the margins ciliate, the apices incurved over the stamens, and keeled on the inside near the base. *Nectary* consisting of five, large, hairy, orange-coloured glands, sitting round the lower half of the germ. *Filaments* erect, inserted into the centre of the five nectarial glands, rather shorter than the petals. *Anthers* bent in towards the stigma. *Germ* superior, oblong, internal structure and contents as in the capsule. *Style* length of the corol. *Stigma* large, flat, composed of five lobes. *Capsules* oblong, rather larger than a field bean, smooth, five-celled, five-valved; valvules opening from the apex and falling off with the seeds. *Seeds* numerous, imbricated, both the ends and the exterior side membrane-winged, affixed to the upper end of the sharp ridges of the receptacle, &c. exactly as in *Swietenia febrifuga*, and *Mahogani*. See *Gært. carp.* ii. 86. *Perisperm* in very small quantity, and more like a fleshy interior integument. *Embryo* inverse. *Cotyledons* oval, three-nerved. *Radicle* obliquely superior. I. 636

The wood of this tree is much like mahogany, but lighter, consequently not so close in the grain. It is much used for furniture and various other purposes. The bark is a powerful astringent, and though not bitter is a tolerably good substitute for *Peruvian Bark* in the cure of remitting and intermitting fevers; particularly when joined with a small portion of the powdered seeds of *Cardiospermum halicacabum* (Kuttakeejee of the Bengalees), which is a most

Page Carey Ed. powerful bitter.

CAMUNIUM. Rumph.

Calyx five-toothed. *Petals* five. *Nectary* globular, apex perforated, inside staminiferous. *Germ* superior, one-celled, from one to two-seeded; *attachment* of the ovula superior.

1. C. *chinense. Rumph. Amb.* v. 28. *t.* 18. *f.* 1.

An elegant shrub, most probably a native of China, at least it has been brought to the Botanic garden at Calcutta from Canton, under the name Sau-yeip-lan, where it blossoms during the hot season, and the early part of the rains in June and July, but has not yet shown any tendency to produce fruit.

Stem in our young, small plant trifling, but many branches and branchlets rising and spreading in every direction. *Bark* of the old ligneous parts olive gray; of the young shoots green, with their very tender apices clothed with stellate ferruginous scales. *Leaves* alternate, petioled, I. ternate and unequally pinnate. *Leaflets* rarely more than five, the pairs opposite, and much 637 smaller than the terminal one, all oblong, but tapering most toward the base, smooth, deep green, entire, obtuse; from an inch and a half to four inches long, and from half an inch to two inches broad. *Petioles* somewhat winged, and channelled. *Panicles*, sometimes only *racemes*, axillary, solitary, shorter than the leaves. *Flowers* minute, yellow, faintly fragrant. *Bractes* ovate, one embracing the insertion of each pedicel. *Calyx* flat, five-toothed: teeth semi-lunar. *Petals* five, oval, concave, at all times pressing on the nectary, smooth, much longer than the calyx. *Nectary* sub-globular, mouth contracted, and slightly five-toothed. *Filaments* scarcely any. *Anthers* five, cordate, attached to the nectary near its base on the inside. *Germ* superior, oblong, hairy, one-celled, with one or two seeds, which are attached to the top of the cell. *Style* none. *Stigma* large, conical.

MILNEA. Roxb.

Calyx five-parted. *Petals* five. *Nectary* urceolate, with the five anthers round its inside. *Germ* three-celled; *cells* from one to two-seeded; *attachment* centripetal, no perisperm.

In honour of Colin Milne, LL. D. author of a *Botanical Dictionary*, *Institutes of Botany*, and other works.

1. M. *edulis. R.*

A tree of middling size, a native of the Garrow hills and of the Silhet district, where it is called *Gumi* by the natives, who eat the large succulent aril which surrounds the seed under the cortex of the berry. Flowering time June and July. The fruit ripens two or three months afterwards.

Young shoots densely clothed with dark brown down, when more advanced smooth. *Leaves* alternate, unequally pinnate, from six to twelve inches long. *Leaflets* from three to I. six pair, sub-opposite, petiolate, lanceolate, entire, smooth but not lucid, obtusely acuminate, 638 from three to six inches long, by one or two broad. *Stipules* none. *Petioles* cylindric, somewhat villous. *Panicles* one from each of the lower axills, nearly as long as the leaves, very ramous and spreading; like the young shoots very downy. *Flowers* numerous, minute, caducous. *Bractes* very minute, caducous. *Calyx* five-parted, small, downy on the outside; segments rounded. *Petals* five, oval, concave. *Nectary* urceolate, rather shorter than the petals, mouth five-toothed. *Filaments* five, very short, inserted on the inside of the bottom of the belly of the nectary. *Anthers* sagittate, and completely hid in the nectary. *Germ* semi-superior, three-celled; *cells* with one or two ovula attached to the axis. *Style* short and thick. *Stigma* turbinate, truncate, six-grooved. *Berry* round-oval, rather more than an inch in diameter, three-celled, containing seldom more than one fertile seed, most of the ovula being in general abortive. *Cortex* firm, rather dry, covered with a rough, brownish gray mealiness. *Seed* solitary, oval, inserted in a complete thick, fleshy, lucid, edible aril, like that of the Lichee of China. *Integument* single, brown, adhering more firmly to the aril than the seed. *Perisperm* none. *Embryo* transverse. *Cotyledons* conform to the seed, equal with the surface, furrowed. *Corculum* transverse, hairy. *Radicle* short, pointing to the umbilicus.

ELÆODENDRUM. Schreb. gen. N. 385.

Corol five-petalled. *Germ* two-celled, two-seeded; *attachment* inferior. *Drupe* superior, oval. *Nut* two-celled. *Embryo* erect, without perisperm.

1. E. *glaucum. Persoon. Synops.* ii. 241. *Roxb. Corom.* ii. 2.

Leaves opposite, oblong, serrate. *Pancles* axillary, dichotomous. *Drupes* spherical.

Schrebera *albens. Willd. spec.* i. 1092.

I. Celastrus *glaucus. Vahl. symb.* ii. 42.

639 Mangifera *glauca. Rottb. in. Nov. Act. Harn.* ii. 534. *t.* 4. *f.* 1.

A middle-sized, or rather small tree, native of various parts of India. From Ceylon it was received into the Botanic garden at Calcutta, under the name Ceylon tea; its leaves are like those of that plant but much longer; their taste slightly bitter and astringent. It flowers in May; the seeds ripen in September and October.

Trunk straight. *Bark* in young trees, smooth, and olive-coloured. *Branches* numerous, spreading in every direction, and forming a very dense, oval head; *young shoots* round, and smooth. *Leaves* opposite, short-petioled, oblong, and cuneate-oblong, sometimes very acutely,

and [illegible] ... Page Curtis b.c.

Stipules a minute scale on each side of the inside of the base of each short, polished petiole. *Panicles* axillary, shorter than the leaves; all its divisions dichotomous and divaricate. *Flowers* pedicelled, small, greenish yellow. *Bractes* small, oblong, from one to three, at the base of each pedicel, and at the divisions of the panicle. *Calyx* of five, somewhat unequal, round, concave, cadneous leaflets. *Petals* five, expanding, linear-oblong, sessile. *Nectary* a green, pentagonal, fleshy, scolloped gland, in which a great part of the germ is immersed. *Filaments* five, inserted on the nectary, usually half the length of the petals, at first nearly erect, but by age becoming so much revolute as to bring the roundish, two-lobed *anthers* under the calyx. *Germ* superior, immersed in the very large, green, fleshy nectary, two-celled, with two ovula in each, attached to the bottom of their cells. *Style* short, conic. *Stigma* simple, obtuse. *Drupe* nearly round, size of a large cherry, smooth, pulpy, when ripe olive-coloured, one-celled. *Nut* oval, rather more acute at the apex than at the base, a little rugose, with two grooves on the opposite sides, inconsiderably thick, and hard; two-celled, though one is often abort. *Seed* solitary, very large, oblong, more convex on the inside. *Integument*; there seem two, rather spongy. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, opposite. *Plumula* minute, two-lobed. *Radicle* oval, inferior, and lodged close to the umbilicus. I. 646

2. *E. indicum. Gært. carp. i.* 274. *t.* 57.

Arbor. *Leaves* opposite, oblong-lanceolate, obtuse, remotely serrulate. *Panicles* axillary, small, dichotomous. *Drupe* and *nut* oblong.

Rubentia. *Jussieu. Genera. plant.* 416.

A middling-sized tree, a native of the Mauritius, where it is called *Bois d'Olive*. Flowers in May and June, and the seeds ripen in October.

MANGIFERA. Schreb. gen. N. 387.

Calyx five-leaved, or five-parted. *Corol* from four to five-petalled. *Germ* one-celled, ovulum single; *attachment* lateral. *Drupe* superior, reniform. *Embryo* sub-erect, without perisperm.

1. M. *oppositifolia. R.*

Leaves opposite, lanceolar, acuminate. *Panicles* terminal. *Stamina* from four to five, all fertile.

Thitsan. the vernacular name at Rangoon in Burma, where the tree is indigenous, and grows to the general size of a small apple tree in England. The wood is somewhat red, hard, close-grained, and said to be very durable. Flowering time the month of March, fruit ripe in June and July.

Branches and *branchlets* smooth and green. *Leaves* opposite, short-petioled, lanceolar, polished, obviously acuminate; from four to six inches long, and from one to two broad. *Stipules* none, but the scales of the bud remain for some time at the base of the young shoots. *Panicles* generally terminal, shorter than the leaves, oblong, rather dense; *ramifications* opposite, smooth in every part. *Bractes* small, caducous. *Flowers* numerous, minute, pale-yellow. *Calyx* from four to five-parted, segments rounded. *Petals* four or five, oblong, a keel down the middle on the inside. *Filaments* four or five, short, alternate with the petals. *Anthers* ovate with an obtuse point. *Germ* obliquely ovate, one-celled, and containing one ovulum attached to the side of the cell, under the perforation of the stigma. *Style* scarcely any. *Stigma* of of three, very unequal lobes, one of which is much more elevated and much larger; between it and the lower and smaller lobes the channel may be traced. *Drupe* sub-ovate, a little compressed, smooth, pale-yellow, the size of a small pullet's egg. one-celled, like the mango the pulp is yellow. and universally eaten in Burma. *Nut* oblong, &c. in every respect like that of the common mango, but much smaller, thin and of a soft texture, easily cut. Flower on the outside, smooth on the inside, chesnut-coloured, one-celled, oval-oblong. *Seed* solitary, conform to the nut. *Integument*, no other than the nut could be observed. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, oblong, fleshy. *Plumula* pointed, curved up, two-lobed. *Radicle* inferior, conic, transverse. I. 643

2. M. *indica. Willd. spec.* i. 1150. *Vahl. en. pl.* i. 7. *Corom. pl.*

Leaves lanceolate. *Panicles* terminal. *Flowers* with one fertile stamen.

Mao, du. Mau, vel. Mangas. *Rheed. Mal.* iv. 1. *t.* 1. 2.

Manga domestica. *Rumph. Amb.* i. 93. *t.* 25.

Mango Ash.

Indian Mango.

Tchoro. Mauritius.

Tree Mangos [illegible]

Of this tree, though one of the most common in India, I have not yet met with any description which deserves the name. I. 642

It is universally cultivated all over India, and all the warmer parts of Asia. It is generally raised from seed, though sometimes by layers, or grafting by approach, which are the only methods of certainly continuing a good sort, probably of improving them. The stones [illegible] are taken from the fruit, whether they be cut vegetate, but [illegible] on the quality of the fruit so much. The seed of a very superior sort will produce fruit of a bad kind; and vice versa, hence such an infinite variety. Colonel Kyd in Bengal, and Dr. Anderson at Madras, have lately begun to graft by approach; which

Page Carey Ed. will no doubt be a means of improving this excellent fruit. Flowering time January, February, and March; the fruit is ripe in May, June, and July.

The tree grows to be of a very great size, with an erect trunk, covered with dark-coloured, scabrous, cracked bark; (large old trees of from ten to fifteen feet in circumference are meant.*) *Branches* very numerous, the lower ones spreading horizontally to a great extent, the upper ones gradually ascending till they become nearly erect in the centre. *Leaves* alternate, petioled, about the extremities of the young shoots, approximated, reclined, lanceolar, entire, often a little waved at the margins, firm, smooth, shining; generally from six to twelve inches long, and from two to three broad. *Petioles* round, smooth, from one to two inches long, thickish at the base. *Stipules* none. *Panicles* terminal, large, erect, or ascending, rigid, a little downy, often tinged with red. *Peduncles* short, thick, rigid. *Bractes* oval, concave, a little downy. *Flowers* small, yellow, with some stripes of red near the base of the petals, many perfect male flowers are often found mixed with the hermaphrodite ones throughout the panicle. *Calyx* five-leaved; *leaflets* oblong, concave. *Petals* five, lanceolate, spreading, twice the length of the calyx. *Nectary* five, large, yellow, fleshy bodies surrounding the base of the germ, forming as it were an excavated, five-lobed receptacle for it to sit in, each of the lobes as large as the germ itself. *Filament* single, subulate, ascending, half the length of the petals, inserted between the lower lobe of the nectary and the germ. *Anther* oval, purple. Besides these there are generally two, three, four, or more, very minute, sterile filament-like bodies, issuing from the apices of the lobes of the nectary. *Germ* obliquely oval, one-celled, and containing a single ovulum, attached to the side of the cell, opposite to the fertile stamen, and under the style. *Style* from the side of the germ, length of the stamen, subulate, declining, so as to bring the *stigma* which is small, and incurved nearly to touch the anther. *Drupe* oblong, or kidney-formed, also a little compressed like a kidney, fleshy, smooth, when ripe yellow, size various, but in general about as large as a goose-egg. *Nut* conform to the *drupe*, but more compressed, woody, one-celled, two-valved, covered on the outside with many fibrous filaments, particularly on the worst sorts.

I. 643

It is by no means necessary for me to mention that the ripe fruit of this tree, (when of a good sort,) is universally eaten, and esteemed the best fruit in India. Jellies, preserves, tarts, pickles, &c. are made of them before ripe.

The kernels are large, and seem to contain much nourishment, however they are made no use of, except during times of scarcity and famine; they are then boiled in the steam of water, and used as an article of diet.

The wood is of a dull gray colour, porous, yet pretty durable if kept dry, but soon decays if exposed to wet. In very large old trees it acquires a light chocolate color towards the centre of the trunk, and larger branches. This is hard, closer grained, and much more durable.

I. 644

From wounds made in the bark, there issues a soft, reddish, brown gum resin, which age hardens, and renders exceedingly like bdellium. Laid on the point of a knife and held in the flame of a candle, it readily melts, catches flame, and burns with a cracking noise; emitting a smell exceedingly like that of *Cashew nuts* when roasting. It softens in the mouth, and adheres to the teeth. Its taste is slightly bitter with some degree of pungency. It dissolves almost entirely in spirits, and in a great measure in water; both solutions are milky with a small tinge of brown.

3. M. *sylvatica*. *R.*

Leaves alternate, lanceolar, glossy. *Panicles* terminal. *Flowers* monandrous. *Drupe* obliquely conic, with the pointed apex turned one side.

Lukshmee am, the vernacular name in Silhet; on the mountains adjoining to that district it grows to be a tall tree of great size. Flowering time October; the fruit ripens in February and March, and is eaten by the natives, though by no means so palatable as even a bad domestic mango, they also dry them and keep them for medicinal purposes.

Leaves as in the common cultivated sorts, alternate, petioled, lanceolar, entire and smooth; from six to eight inches long, by one and a half or two broad. *Panicles* terminal, much larger than in the domestic sorts, and with the numerous ramifications more erect and slender. *Flowers* very numerous, small, white, with a faint shade of pink; they are more completely monandrous than any of the cultivated sorts. *Calyx* five-leaved, many times shorter than the corols. *Petals* five, linear, spreading, and finally becoming somewhat twisted and revolute. *Nectary* a short, solid, turbinate, slightly grooved, villous receptacle for the germ to rest on. In the domestic sorts it is composed of five distinct glands, which embrace the base of the germ. *Filament* single, inserted into the pot of the nectary, incurved, length of the pistillum. *Anther* oval. *Germ* elevated on the above-mentioned nectary or receptacle, unequally oval, smooth, one-celled; *ovulum* single, attached to that side of the cell from whence the style rises, and most remote from the stamina. *Style* subulate, length of the filament, incurved, after fecundation recurved. *Stigma* simple, acute. *Drupe* ovate, obliquely acuminate, smooth, when ripe yellow, like the common mango and nearly as large, one-celled. *Nut* oblong, less fibrous than in the common sorts, and also less firm, with an even surface. *Seeds* solitary, conform to the nut. *Integument* single. *Perisperm* none. *Embryo* between erect and transverse. *Cotyledons* equal, conform to the seed. *Radicle* lodged between the cotyledons on one side of their base, pointing out, and rather upwards.

I. 645

HARPULLIA. R.

Calyx five-leaved. *Corol* five-petalled, alternate with the stamina. *Germ* two-celled;

* A grove of that size is before my door, and a most noble sight it is.

cells one-seeded; *attachment* of the ovula sub-superior. *Capsules* two-celled. *Seed* solitary, arilled. *Embryo* with incumbent cotyledons, and lateral radicle without a perisperm. Page Carey Ed.

1. H. *cupanioides. R.*

Harpulli the vernacular name at Chittagong.

A small tree; a native of the hilly parts near Chittagong, it flowers in April; and the fruit ripens in July.

Trunk straight. *Branches* few, and tending to be erect also; *bark* ash-coloured; *young shoots* smooth. *Leaves* alternate, abruptly pinnate, from twelve to eighteen inches long. *Leaflets* from four to six pair, short-petiolate, from alternate to opposite, from ovate below to lanceolar above; all are entire, and smooth on both sides; apex considerably pointed; from three to six inches long, by one or two broad. *Petioles* round and smooth. *Panicles* axillary, solitary, erect, thin of branches, and shorter than the leaves. *Flowers* small, pale yellow. *Bractes* subulate. *Calyx* inferior, five-leaved, permanent; *leaflets* oval. *Petals* five, lanceolate, obtuse, spreading, becoming recurved. *Filaments* five, alternate with the petals, and much shorter. *Anthers* oblong. *Germ* ovate, hairy, somewhat two-lobed, two-celled, with one pendulous ovulum in each attached to the upper end of the partition. *Style* short. *Stigma* two-lobed; *lobes* reflex, adnate. *Capsules* pendulous, orbicular, two-lobed, considerably compressed, villous, two-celled, two-valved, opening all round. *Partition* opposed to the valves. The whole very exactly resembling the capsule of *Geloneum cupanioides. Gært. carp.* ii. 271. *t.* 139. *Seed* solitary, semi-oval; the inner side being straight, the exterior rounded, arilled. *Integument* single, rather thin, smooth, chesnut colour. *Aril* deep orange, covering the whole seed from the base except the apex. *Perisperm* none. *Embryo* green. *Cotyledons* two, conform to the seed, incumbent, their line of separation being nearly through the middle of the seed, which makes them equal. *Radicle* on the exterior or convex side of the seed, apex rather acute, and turned up into a small hollow in the uppermost cotyledons, so that it points to the apex of the seed. After it has lengthened a little by the progress of vegetation, the two-lobed *plumula* is very conspicuous. I. 646

NEERIJA. R.

Calyx five-leaved. *Corol* five-petalled. *Style* simple. *Berry* superior, one or two-seeded.

1. N. *dichotoma. R.*

Telinga. Neerija.

A middle-sized tree, a native of the mountains of Coromandel. Flowers about the beginning of the hot season.

Trunk erect. *Bark* rust-coloured, scabrous. *Branches* numerous, spreading in every direction. *Branchlets* opposite, round and smooth. *Leaves* opposite and alternate, petiolate, oval and oblong, serrato-crenate, smooth; about four inches long, and two broad; texture hard. *Petioles* round, three-quarters of an inch long. *Panicles* axillary, globular, thin, throughout dichotomous, with the divisions standing at right angles. *Peduncles* three times the length of the petioles, round, smooth. *Flowers* small, yellow, not very numerous. *Calyx* five-leaved; *leaflets* orbicular, unequal, caducous. *Petals* five, oblong, spreading. *Nectary* a large, fleshy, pentagonal ring surrounding the base of the germ, into its angles the filaments are inserted. *Filaments* five, shorter than the petals, spreading. *Anthers* two-lobed. *Germ* superior, conical. *Style* shorter than the stamens, thick. *Stigma* simple. *Berry* oblong, succulent, red, smooth, one-celled. *Seeds* one, or two. I. 647

Is nearly allied to *Elæodendrum glaucum* in habit, but in that the drupe with a single, very thick, hard nut will alone be sufficient to distinguish them.

The fresh bark of the root, rubbed with plain water, is by the natives applied externally to remove almost every sort of swelling. It is a very strong astringent possessing scarcely any other sensible quality.

VARECA. Gært.

Calyx five-leaved, or five-parted. *Corol* five-petalled. *Germ* superior, one-celled; *ovula* numerous, their attachment parietal. *Berry* one-celled. *Seeds* a few, inserted on the three parietal receptacles.

1. V. *moluccana. R.*

Leaves alternate, lanceolar. *Peduncles* axillary, many-flowered. *Filaments* free.

A small tree, from fifteen to twenty feet in height, a native of the Molucca islands, and from thence introduced into the Botanic garden at Calcutta, in 1798, where it blossoms in October and November, and again in March, April, and May; but has not yet, though now fourteen years in Bengal, produced even well-formed fruit, so that the genus is still doubtful. I. 648

Trunk erect. *Branches* numerous, between erect and patent. *Bark* of the old parts smooth, and ash-coloured; of the young shoots with a little, short, ferruginous pubescence. *Leaves* alternate, about the end of the branchlet, short-petioled, lanceolar, entire, waved, acute, smooth, and glossy above; from four to twelve inches long, and from one to four broad. *Stipules* none. *Peduncles* axillary, solitary, about an inch long, many-flowered, villous. *Flowers* middle-sized, white, inodorous, pedicelled. *Bractes* small, caducous. *Calyx* one-leaved, five-toothed, villous, caducous. *Petals* five, linear-oblong, recurved, many times longer than the calyx. *Filaments* five, inserted on the receptacle, shorter than the germ, and pressing upon it. *Anthers* sagittate. *Germ* superior, oblong, torulose, villous, one-celled, with many ovula, attached to two or three parietal receptacles. *Style* short. *Stigma*

Page Carey Ed. pretty large, two or three-lobed.

2. V. *lanceolata. R.*

Leaves alternate, lanceolar. *Flowers* in axillary fascicles. An erect, shrubby plant, a native of Pulo Pinang.

Leaves alternate, bifarious, short-petioled, lanceolate; *veins* numerous, simple and parallel; smooth on both sides. *Stipules* within the leaves, lanceolate, chaffy. *Flowers* small, numerous, collected on short-peduncled, axillary, compound corymbs, pale yellow. *Calyx* five-leaved; *leaflets* oval, concave, permanent. *Petals* five, lanceolate, expanding, permanent. *Filaments* five, shorter than the petals, incurved, united at the base into a ring round the lower half of the germ. *Anthers* arrow-shaped, erect. *Germ* superior, ovate, hairy. *Style* longer than the stamens, hairy. *Stigma* simple. *Capsules* three-lobed, leathery, one-celled, evalvular. *Seeds* several, affixed to three, vertical, parietal receptacles, on the inside of the middle of the lobes of the capsules.

3. V. *heteroclita. R.*

I. 649 Shrubby. *Leaves* broad-lanceolar, crenate. *Flowers* axillary, crowded, sessile.

A small shrub, received into this garden from General Martin at Lucknow. Blossoms in October.

Stem short and slender; *bark* smooth, ash-coloured. *Branches* bifarious, slender, all spreading nearly horizontally. *Leaves* alternate, bifarious, sessile, cuneate-lanceolar, crenate, smooth on both sides; in the axill of each vein on the under side is a remarkable hollow gland. *Stipules* ensiform. *Flowers* axillary, crowded, sessile, small, white. *Calyx* of five, unequal, imbricate, woolly, margined leaflets. *Petals* five, lanceolate, confined at the base, by the rigid leaflets of the perianth, into a bell shape; above they are revolute and smooth on both sides. *Filaments* five, long, and slender, projecting considerably beyond the mouth of the bell-shaped part of the corol, at the base each side is enlarged with one or more adjoined hornlets which are bearded at the base. *Germ* superior, ovate, somewhat three-sided. *Style* as long as the stamens, villous; *stigma* simple. In the germ are the rudiments of two, three, or four seeds.

VIOLA. Schreb. gen. N. 1364.

Calyx five-leaved. *Corol* five-petalled, irregular, calcarate. *Anthers* united. *Capsules* superior, three-valved, one-celled. *Seeds* many, parietal. *Embryo* furnished with a perisperm; *radicle* centrifugal.

1. V. *suffruticosa. Willd. spec.* i. 1171.

Perennial, diffuse. *Leaves* alternate, sub-sessile, lanceolate. *Stipules* subulate. *Peduncles* axillary, with two bractes near the middle. *Corol* resupine. *Capsules* round.

A native of the sandy lands about Madras. In the Botanic garden at Calcutta it continues in flower and seed most part of the year.

I. 650 *Stem* scarcely any, but many diffuse, perennial, round, smooth branches, often extending to a foot in length. *Leaves* alternate, sub-sessile, lanceolate, slightly serrate, pretty smooth, about an inch long, and a quarter of an inch broad. *Stipules* small, subulate. *Peduncles* axillary, solitary, one-flowered; shorter than the leaves, jointed above the middle, where there are two small bractes, one on each side. *Calyx* five-leaved. *Leaflets* nearly equal, lanceolate, acute. *Petals* five, rosy, the two upper ones smallest, linear-oblong, and pointed; the two lateral ones sub-ovate, with long, taper, recurved apices; the lower one (here the corol is resupinate,) much larger than the others, broad-cordate, supported on a claw as long as the superior petals, which is protruded behind, between the two lower leaflets of the calyx, into a gibbous nectary. *Filaments;* the two lower ones have each a ciliate hornlet projecting back. *Anthers* with brown, ovate, scariose apices. *Capsules* nearly round, size of a pea, one-celled, three-valved. *Seeds* several in each cell, attached to a ridge which runs along the inside of each valve, obovate. *Integument* single, thin, striated. *Perisperm* conform to the seed, white. *Embryo* three-fourths the length of the perisperm, greenish. *Cotyledons* oval. *Radicle* sub-cylindric, pointing to the umbilicus, at the small end of the seed.

2. V. *enneasperma. Willd. spec.* i. 1171.

Perennial, rather diffuse. *Leaves* lanceolate. *Corol* with little or no horn behind.

Nelam. parenda. *Rheed. Mal.* 9. *t.* 60. rather a bad figure.

3. V. *primulifolia. Willd. spec.* i. 1162.

Annual, stemless. *Leaves* from triangular to lanceolar-cordate, serrate, decurrent. *Flowers* resupinate; in that position the lower petal is broader, and emarginate.

Native of the interior parts of Bengal; in the Botanic garden at Calcutta it blossoms and ripens its seeds more or less the whole year.

I. 651 4. V. *apetala. R.*

Annual, stemless. *Leaves* broad-cordate, sagittate, serrate lobes, and apex rounded, in luxuriant plants the scapes are many-flowered. *Flowers* diandrous, and very generally without a corol.

Received from the Mauritius into the Botanic garden in Bengal, where it is in constant flower and seed the whole year.

IMPATIENS. Schreb. gen. N. 1365.

Calyx two-leaved. *Corol* five-petalled, irregular. *Nectary* cucullate. *Anthers* united. *Germ* five-celled; *cells* many-seeded; *attachment* central. *Capsules* superior, five-celled, five-

valved. *Seed* numerous. *Embryo* naked, with centripetal radicle. Page Carey Ed.

1. I. *Balsamina. Willd. spec.* i. 1175.

Leaves lanceolate, serrate. *Peduncles* one-flowered. *Nectary* shorter than the flower.

Tilo-Onapa. *Rheed. Mal.* ix. 101. *t.* 52.

Beng. Doopati.

Hind. Gool-mendee.

2. I. *tripetala. R.*

Leaves alternate, opposite and tern, broad-lanceolar, serrate. *Peduncles* from one to many-flowered. *Corol* three-petalled; horn of the ample nectary hooked.

A native of the mountains near Silhet, where it flowers and ripens its seed more or less the whole year round. *Rheede's Tilo-Onapu* is, I think, more like this than it is to I. *Balsamina*, though quoted for that species; and I can scarcely conceive this to be that plant in its original wild state.

Root annual, fibrous. *Stem* erect, swelled at the leaves, scarcely pubescent in any respect. *Branches* opposite, several pairs, and generally below the middle of the plant; whole height from one to two feet. *Leaves* on the stem opposite, and tern; on the branches often alternate, long-petioled, broad-lanceolar, serrate, a little hairy, particularly the serratures; about three inches long, by one broad. *Flowers* axillary, from one to many, in the latter case their long pedicels are inserted on a very short, common peduncle. *Perianth* of two, small, bracte-like leaflets. *Corol* three-petalled; the upper one forming a roof over the interior part of the whole flower; *lateral* pairs composed of two, large, roundish lobes each; the lower lobes thereof forming the lip. *Nectary* large, with a hooked or incurved slender horn from its obtuse end. *Stamina*, &c. as in the genus. I. 652

It has a pretty appearance when in full blossom, the flowers being numerous, large, and of a lively red colour, with the nectary deeply tinged yellow.

3. I. *natans. Willd. spec.* i. 1175.

Leaves linear-lanceolate, serrate. *Peduncles* three-flowered. *Berries* five-seeded.

Telinga. Neer-Ganaroo, i. e. *water Oleander.*

This is a large annual species; a native of ponds, ditches, &c. of sweet water. It flowers during the rainy and cold seasons.

Stem piped, all the parts that grow in, or float on the water, bending in various directions, and being often some yards in length; the part above the water is erect, branchy and from one to two feet high. The former part is jointed, with roots from the joints, and the pipe interrupted there; the erect part five-sided, smooth, coloured, as thick as the fore-finger; pipe interrupted at the leaves, as in the floating parts. *Leaves* sessile, scattered, lanceolate, serrate, smooth: from four to five inches long, and less than one broad; there is a gland on each side of the base instead of stipules. *Peduncles* axillary, solitary, generally three-cleft, three-flowered. *Bractes* (Involucres) oblong. *Flowers* large, very beautifully variegated with red, white, and yellow. *Pericarp. Berry* sub-globular, five-grooved, succulent, smooth, red, size of a cherry. *Seeds* five, hard, nut-like, obliquely oblong, lapped over at both ends. I. 653

When in flower, this is one of our most elegant water plants.

LEEA. Schreb. gen. N. 1432.

Calyx five-toothed. *Corol* one-petalled, with a five-cleft, staminiferous nectary in the mouth of the tube. *Germ* six-celled; *cells* one-seeded.

This definition includes, I think, *Aquilicia samucina*, which of course I do not consider as a distinct genus.

The position of the anthers in this family is so remarkable and anomalous, that I know of nothing like it elsewhere. The filaments are inserted into the bottom of the fissures of the nectary, and rise parallel with its segments, to their height, where they are quickly bent in and down, to their projecting apices, the inverted anthers are attached near the middle of their backs, with their sides touching, and in most of the species, as firmly united as in any syngenesious plant, forming a cylindrical tube round the stigma; in this position they remain, until by the detachment of the filaments from the nectary, they fall off in one body.

1. L. *macrophylla. R.*

Herbaceous. *Leaves* simple.

Sans. Sumoodruka.

Beng. Dhol-Shumoodra.

Is common throughout Bengal. Flowering time the rainy season.

Root tuberous, perennial, red. *Stem* erect, annual, flexuose, jointed. *Leaves* simple, alternate, petioled, broad-cordate, irregularly serrate, or tooth-lobed; posterior lobes large and overlapping each other; smooth on both sides, except that on the under side the numerous veins are very protuberant, of which the larger are always opposite; from one to two feet long, and nearly as broad. *Petioles* tapering from the base, furrowed below, channelled above, as far as the stipule-like membrane reaches. *Cymes* terminal, large; first division three-parted, or three distinct cymes, superior divisions less regular. *Flowers* very numerous, small, white. *Bractes* small, falling. *Calyx* five-toothed, permanent. *Corol* one-petalled. *Tube* length of the calyx. *Border* five-parted; *divisions* lanceolate, expanding with an incurved apex, and there bagged. *Nectary;* in this species the apices of the divisions are entire. *Filaments* five, length of the nectary, and inserted on the bottom of its five fissures. *Anthers* inverted within the mouth of the nectary, with their sides united. *Germ* superior, six-celled, with one ovulum in each, attached to the base of the axis. *Style* cylindric. *Stigma* I. 654

Page Carey Ed. simple, perforated, lodged about the middle of the inverted anthers. *Berry* much depressed, torose, size of a small cherry, obscurely six or more-lobed, smooth, black, and succulent when ripe, six or more-celled. *Seeds* solitary. *Integuments* two; the *exterior* one somewhat nuciform, pretty thick, and brown; the *inner* one very thin, and lighter coloured, adhering to the perisperm. *Perisperm* conform to the seed, deeply intersected with brown, clammy fissures. *Embryo* small, scarcely half the length of the perisperm, subulate. *Cotyledons* subulate. *Radicle* inferior, pointing to the umbilicus.

Obs. The root promises to yield a colour fit for dyeing; its taste is astringent, and it is mucilaginous.

2. L. *crispa. Willd. spec.* i. 1177.

Herbaceous, stem and branches fringed at the angles. *Leaves* pinnate; *leaflets* oblong, serrate. *Anthers* free.

Nalugu. *Rheed. Mal.* ii. 43. *t.* 26.

Beng. Bun-chelta.

Grows wild among bushes near Calcutta. Flowering time the rainy season; and though the flowers are not conspicuous yet the uncommonly elegant curled wings give to the whole
I. plant a great degree of beauty.
655 *Root* perennial. *Stems* several, herbaceous, somewhat woody, from four to five feet high, jointed, swelled above the joints, the young shoots chiefly are ornamented with from six to eight, thin, short, much curled wings. *Leaves* alternate, petioled, generally quinate-pinnate, though in luxuriant plants the lower pair is sometimes compound. *Leaflets* petioled, ovate-oblong, pointed, deeply and acutely serrate; veins numerous, simple, parallel, large, running off at an angle of about forty-five degrees, corresponding in number with the serratures of the margin, and ending in their points, as in *Dillenia speciosa*. *Petioles* four or five-winged; wings curled, &c. as on the branches. *Stipules* falcate, not ciliate. *Cymes* terminal, small, a little hairy, five-flowered. *Bractes* minute, hairy, margins running down the next peduncle or pedicel immediately below, forming a deep groove thereon, with high winged margins. *Calyx* absolutely five-toothed, permanent. *Corol* as in the last species. *Nectary* also as in the last. *Anthers* lodged within the mouth of the nectary, but not adhering to one another. *Germ* conical, six-celled, with one *ovulum* in each, attached to the base of the axis. *Style* five-grooved. *Berry* round, size of a small cherry, when ripe smooth, black, and succulent, six-celled. *Seeds* one in each cell, all of which very frequently come to perfection, obliquely-obovate, inserted near the inner and lower angle to the lower part of a soft, central receptacle. *Integument* single, hard, and pretty smooth; a very thin membrane seems to cover and adhere to the perisperm. *Perisperm* conform to the seed, deeply intersected with brown, clammy fissures. *Embryo* small, lodged in the base of the perisperm near the umbilicus, a little incurvate. *Cotyledons* subulate. *Radicles* inferior, oblong.

3. L. *robusta. R.*

Shrubby, jointed, pubescent. *Leaves* bi- and tri-pinnate; *leaflets* ovate-lanceolate, ser-
I. rate, cuspidate. *Nectary* sub-globular.
656 A native of the northern Circars. In the Botanic garden at Calcutta, it flowers during the rains.

Stems in plants five years old erect, about five or six feet high, stout, simple, flexuous, jointed, round, the woody parts pretty smooth, the more tender parts rather harsh, with coarse, short pubescence. *Leaves* alternate, from pinnate to tripinnate, from one to three feet long, and often broader than long. *Leaflets* ovate-lanceolate, the lateral ones with a broad-cordate base, serrate, hairy underneath; from five to ten inches long, and from three to five broad. *Petioles* channelled on the upper edge. *Stipules* petiolary, large, semi-elliptic, villous, caducous. *Cymes* terminal, super-decompound, villous. *Flowers* very numerous, small. *Bractes* linear, villous, caducous. *Calyx* campanulate, five-toothed. *Corol* green, five-cleft. *Nectary* round, urceolate, pearl-coloured, inserted on the mouth of the small tube of the corol, and there contracted by a sharp vein on the inside, deeply five-parted; segments linear-oblong, fleshy, with a thin, rounded apex. *Filaments* inserted into the bottom of the fissures of the nectary, above the middle jointed, and there bent in and down. *Anthers* linear-oblong, inverted, and in that position their margins are firmly united into a ring round the stigma. *Germ* superior, ovate, six-celled, with one ovulum in each, attached to the base of the axis. *Style* short, but thin, and six-grooved. *Stigma* rather large, entire, convex. *Berry* much flattened, size of a small cherry, smooth, black, and somewhat succulent, six-lobed, six-celled. *Seed* solitary. *Perisperm* conform to the seed, intersected with some deep brown fissures, as in all the other species examined by me. *Embryo* small, a little curved. *Cotyledons* subulate. *Radicle* inferior, pointing to the umbilicus.

4. L. *hirta. Herb. Banks.*

Shrubby. *Leaves* pinnate, and bi-pinnate; *leaflets* lanceolate, serrate, hairy. *Anthers* connected.

I. *Beng.* Kakujangha.
657 A native of the lower parts of Bengal. Flowering time the rainy season.

Stems several, somewhat woody, flexuose, jointed. *Bark* greenish, slightly scabrous; branches few, and like the stem. *Leaves* alternate, petioled, from simple to decompound. *Leaflets* opposite, oblong, serrate, scabrous and hairy on both sides, particularly on the under one, from two to eight inches long, and from one to three broad. *Petiole* and *petiolets* round, scabrous and hairy. *Stipules* petiolary. *Cymes* terminal, three-parted. *Nectary* inserted into the edge of the projecting ring which surrounds the mouth of the tube of the corol, the tube of which is erect, and five-parted; *divisions* oblong, emarginate. *Filaments*

five, the length of the nectary, and inserted into the bottom of its five fissures. *Anthers* oblong, three-fourths or more lodged within the mouth of the nectary, with their points downwards, and firmly coalescing at the sides into a tube. *Berry;* when ripe it has much the appearance of a black currant, a little flattened, generally six-seeded, when dry it appears with as many lobes, *(torose).* *Seeds*, &c. exactly as in the former and following species. Page Carey Ed.

5. L. *sambucina. Willd. spec.* i. 1177.

Shrubby. *Leaves* from simple to decompound; *leaflets* ovate, oblong, serrate, smooth. *Cymes* super-decompound.

Frutex aquosus, foemina. *Rumph. Amb.* iv. *t.* 45.

Aquilicia *Sambucina. Linn. Mant.* 211. *Gært. carp.* 2. 127. *t.* 108.

A native of the Moluccas, from thence introduced into the Botanic garden at Calcutta, in 1798, where it blossoms during the rains, and ripens its seed in November, December, and January.

Stems erect, almost straight, ramous, height of the whole plant from eight to twelve feet. *Bark* slightly furrowed lengthways, in other respects smooth. In this species roots generally descend to the ground from the lower joints of the stems. *Leaves* from simple to decompound. *Leaflets*, the single leaves, which are rarely present, from ovate to nearly round; those of the compound leaves from ovate-oblong to linear-oblong, serrate, smooth on both sides. *Corymbs* terminal, trichotomous. *Flowers* small, yellow; structure as in the former species. *Berries* round, pulpy, smooth, glaucous, black, size of a marrow-fat pea, six-seeded; when dry torose. I 658

6. L. *Staphylea. R.*

Shrubby. *Leaves* compound and super-decompound; *leaflets* linear-oblong, finely taper-pointed, serrate, smooth on both sides. *Cymes* thin.

Aquilicia Otillis *(Otillis zeylanica.) Gært. carp.* i. 275. *t.* 57.

Staphylea? *indica. Burm. Ind.* 75. *t.* 24. *f.* 2.

Beng. Kookoor-jihwa.

Teling. Ancados.

Stems several, erect, stout, ligneous. *Branches* few; the young ones flexuose, smooth; round, articulated. *Leaves* alternate, compound, and decompound, commonly about eighteen inches long; *pinnæ* opposite, generally two pair, the lower pair is sometimes compound; all terminate with an odd one. *Leaflets* opposite, petiolated, linear-oblong, pointed, serrate, smooth on both sides; from four to seven inches long, and from two to three broad. *Petioles* and *petiolets* round, smooth. *Stipules* large, adjoined to the lower part of the petiole, coloured, leathery, falling. *Cymes* terminal, large, with frequently a smaller one accompanying the chief one. *Flowers* small, greenish white, very numerous. *Calyx* cup-shaped, five-toothed, permanent. *Corol* one-petalled. *Tube* a little longer than the calyx. *Border* five-parted; *divisions* oblong, concave, with an incurved point. *Nectary* a yellow, fleshy, five-cleft ring, inserted into the mouth of the tube of the corol, descending with a contracted rim considerably into it, and rising about it: *divisions* emarginate. *Filaments* five, inserted into the outside of the nectary, just below, or rather in the lower sloping edge of its fissures. *Anthers* oblong, inverted within the nectary, their sides adhering to each other as in the plants of *Syngenesia. Germ* superior, globular. *Style* the length of the tube of the corol. *Stigma* simple. *Berry* dry, size of a small cherry, flattened, five or six-grooved, five or six-celled. *Seeds* one in each cell. I. 659

7. L. *integrifolia. R.*

Sub-arboreous. *Leaves* super-decompound; *leaflets* lanceolar, entire, acuminate. *Corymbs* super-decompound.

Teling. Booradipakai.

A native of the moist vallies among the Circar mountains. It is a large shrub, and flowers during the wet season.

Leaves alternate, super-decompound, about thirty inches long. *Pinnæ* as in the last species; the lower pair always bipinnate. *Leaflets* opposite, sub-sessile, linear-lanceolate, and lanceolar, sometimes very slightly serrate; smooth above, a little downy underneath, from six to eight inches long, and from two to three broad. *Petioles* and *petiolets* smooth, with an elevated ridge running along the upper side; beyond the lower pair of pinnæ the ridge has a groove in it. *Stipules* as in the former. *Corymbs* terminal, &c. as in the last species, but larger. *Calyx* as in the other species. *Corol; tube* shorter than the calyx, in other respects as in the last species. *Nectary* composed of five erect, emarginate scales, issuing from the mouth of the tube of the corol. *Filaments* five, alternate with and longer than the nectarial bodies. *Anthers* oblong, pointed. *Pistil, pericarp*, and *seeds*, as in the last species; it is rather more common for the capsule to be six-seeded in this species than in the others.

VITIS. Schreb. gen. N. 396.

Calyx five-toothed. *Corol* five-petalled. *Germ* two-celled; *cells* two-seeded; *attachment* inferior. *Berry* superior, from one to four-seeded. *Embryo* erect, and furnished with a perisperm. I. 660

1. V. *indica. Willd. spec.* i. 1180.

Shrubby, scandent. *Leaves* round-cordate, often more or less angled, finely serrate, downy underneath. *Tendrils* panicle-bearing. *Germ* embraced by a five-lobed cup. *Berries* round, from one to two-seeded.

Schembra-valli. *Rheed. Mal.* vii. 11, *t.* 6.

Page Carey Ed.

Beng. Amdhouka.

A native of various parts of India. Flowering time the month of April. The fruit ripens in July.

Root perennial. *Stem* and *branches* long and slender, climbing up and over trees, hedges, &c. to an extent of many fathoms; *young shoots* villous. *Tendrils* opposite to the leaves, floriferous, beyond the flowers bifid. *Leaves* alternate, petioled, round-cordate, more or less angular, finely serrate, more or less villous according to their age, particularly underneath, from three to six inches each way. *Petioles* rather shorter than the leaves. *Panicles* issuing solitarily from the middle of the tendrils, peduncled, ovate, dense. *Flowers* numerous, very minute, greenish purple. *Calyx* small, five-toothed. *Petals* five, ovate-oblong, at first spreading, afterwards reflex, and not cohering at top as in some of the species. *Nectary* a five-toothed, saucer-shaped body, surrounding the base of the germ. *Filaments* five, nearly as long as the petals. *Germ* superior, nearly round, two-celled, with two ovula in each, attached to the bottom of the cell. *Style* none. *Stigma* five-lobed.

2. V. *lanata. R.*

Shrubby, climbing. *Leaves* cordate, serrate, woolly underneath. *Racemes* panicled, leaf-opposed. *Petals* cohering at top.

I. 661 A native of the forests amongst the Circar mountains. Flowering time the cold season. *Trunk* woody, climbing over trees, &c.; *young shoots* very long, covered with a little rusty wool. *Tendrils* opposite, simple, or split. *Leaves* alternate, petioled, cordate, serrate; above a little woolly, below much so; four inches long, by three broad. *Petioles* round, woolly, two inches long. *Peduncles* opposite, composed of compound racemes, a little woolly. *Flowers* very numerous, small, green, fascicled. *Petals* cohering at the top; when they drop they seem to be a monopetalous corol, and what was the top must then be considered as the bottom. *Berries* round, purple, succulent, size of a pea, one or two-seeded.

3. V. *latifolia. R.*

Herbaceous, climbing. *Leaves* cordate-lobate, crenate-serrate, smooth. *Tendrils* panicle-bearing. *Petals* oblong. *Germs* embraced by a nectarial cup.

Vallia-Pira-Pitica. *Rheed. Mal.* vii. 13. *t.* 7.

Beng. Govila.

A native of Bengal and of the warmer maritime parts of India, blossoming about the beginning of the rainy season; and ripening its fruit in July.

Root tuberous. *Stem* and *branches* herbaceous, climbing, round, and smooth, very long, and slender, running over trees, &c. to a great extent. *Tendrils* leaf-opposed, generally two-parted, panicle-bearing. *Leaves* petioled, alternate, always opposite to a tendril, nearly of a round, cordate-lobate shape, with three, five, or seven rather acute lobes; margins serrate-dentate, pretty smooth on both sides, length and breadth from three to nine inches. *Panicles* issuing solitarily from the middle of the tendrils before they divide; *peduncles* ovate, dense. *Flowers* very numerous, small, of a deep reddish brown. *Bractes* linear. *Calyx* small, obscurely five-toothed. *Petals* oblong, at first expanding, then reflexed. *Germ* superior, nearly

I. 662 round, two-celled, with two ovula in each, attached to the bottom of the cell. *Style* none. *Stigma* a pit in the lobate apex of the germ. *Berry* the size, shape, and appearance of a black currant, rarely more than two-seeded. *Perisperm* conform to the seed. *Embryo* erect, in the lower half of the perisperm. *Cotyledons* nearly round. *Radicle* inferior.

4. V. *parvifolia. R.*

Leaves angle-cordate, three-lobed, crenate-serrate, smooth. *Stipules* oval. *Thyrses* leaf-opposed, few-flowered.

A slender, perennial vine, of exactly the habit of the common grape vine; a native of the eastern part of Bengal. Flowers in February.

Stems and old *branches* ligneous, considerably flattened, ten or twelve feet high. *Bark* dark brown, with the exterior lamina thin, and frequently peeling off; *young shoots* somewhat angular, and pretty smooth. *Leaves* simple, cordate, sometimes three-lobed, crenate-serrate, apex somewhat attenuate, smooth on both sides, about two inches long. *Tendrils* bifid. *Stipules* oval, caducous. *Thyrses* opposite to the leaves, diverging, very small, and only a little longer than the *petioles*. *Flowers* very minute, green. *Calyx* obscurely five-lobed. *Petioles* five, cohering, and falling off in one body. *Nectary* five-rounded scales, embracing the base of the germ, alternate with the filaments. *Filaments* five, length of the germ, at first erect, but by age becoming recurved. *Anthers* ovate. *Germ* round, four-celled, with one *ovulum* in each, attached to the base of the axis. *Style* scarcely any. *Stigma* obscurely lobed.

MUSA. Schreb. gen. N. 1563.

Polygamous. *Calyx. Spathes* partial, one or many flowered. *Corol* of two unequal petals. *Flowers* all hermaphrodite. Male-hermaphrodite toward the apex of the spadix. *Germ* inferior, abortive. Female-hermaphrodite toward the base of the spadix. *Germ* infe-

I. 663 rior, three-celled; *cells* many-seeded; *attachment* central. *Berry* oblong, three-celled, many-seeded. *Embryo* central, and amply furnished with a perisperm.

1. M. *sapientum. Willd. spec.* iv. *p.* 894.

Spadix drooping, spathes ovate, deciduous; those of the female-hermaphrodite flowers of the wild plant often wither and remain till the seeds are ripe, but in the cultivated varieties they are always deciduous.

Bata. *Rheed. Mal.* i. 17. *t.* 12, 13, and 14.

Musa. *Rumph. Amb.* v. 130. *t.* 60.

Page Carey Ed.

Ram Kulla, Walli-kulla, Ram Jakialia-kulla, are the names the wild *banana* and plantain are known by at Chittagong where they are found indigenous in the forests, and blossom during the rains.

Beng. Kula.

Telinga. Aretti ; and Komaretti the cultivated plantain.

The varieties of the *banana*, cultivated over India, are very numerous, but fewer of the plaintain, as I have hitherto obtained knowledge of only three ; whereas, I may safely say, not less than ten times that number of the former have come under my inspection.

Their duration, culture, habit, and natural character are already well known ; I shall therefore confine myself to (what I think,) the original wild *Musa*, from which I conclude all the cultivated varieties of both plantain and *banana* proceed, and which I consider as varieties of that one species.

In the course of two years, from the seed received from Chittagong, these attained to the usual height of the cultivated sorts which is about ten or twelve feet. They blossom at all seasons, though generally during the rains ; and ripen their seed in five or six months afterwards ; the plant then perishes down to the root, which long before this time has produced other shoots ; these continue to grow up, blossom, &c. in succession for several years.

I. 664

Their *leaves* are exactly as in the cultivated sorts. *Spadix* simple, drooping. *Spathes* partial, numerous, ovate, concave, smooth, crimson on the inside, outside darker-coloured, six or eight of these nearest the base of the spadix embrace a double row of female-hermaphrodite flowers, and are not always deciduous, but sometimes wither, and remain till the seeds are ripe. All the rest, and they are very numerous, expanding in succession for two or three months, embrace similar double rows of abortive, or male-hermaphrodite flowers ; which, with their spathes, are always deciduous. *Calyx* no other than the just mentioned spathes. *Corol* of two, dissimilar petals ; the *exterior* one with an unequally five-toothed apex, which soon becomes revolute, the *inner* one sometimes called the *nectary*, half the length of the *exterior* one ; when forcibly expanded they are nearly round, but in their natural state oblong, and deeply concave, with an emarginate apex, and incurved, ensiform point. *Filaments* in both flowers five, with sometimes the rudiment of a sixth. *Anthers* in the male-hermaphrodite linear, and as long as the filaments ; in the female-hermaphrodite minute, and without pollen. *Germ* inferior, oblong, three-celled, with from four to five or six rows of ovula in each cell, regularly attached to a central, fleshy receptacle axis ; by their growth they are forced from the regular situation in which they are found in the germ, their insertions cannot then be easily traced ; in the male-hermaphrodite they are abortive. *Style* cylindric. *Stigma* three-lobed, large and clammy. *Berry* oblong, tapering to each end ; of a soft fleshy consistence, smooth and yellow, marked longitudinally with five ribs, three-celled ; the partitions distinct, but soft and pulpy, and no doubt disappear when dry, and long kept. *Seeds* numerous, the size of a small pea, round, turbinate, tubercled ; the *exterior* half dark-chesnut or blackish toward the umbilicus, which is a large circular cavity ; light brown. *Integument*, &c. as described and figured by *Gærtner Carp.* i. 28. 9. *t.* 11.

I. 665

2. M. *coccinea. Andr. Repos.* i. 47.

Spadix and *spathes* straight, the latter one or two-flowered, and permanent.

Chin. On-aug-chok-chee.

This has been brought from China, where it is said to be indigenous. It thrives well in the Company's Botanic garden at Calcutta, where I long took it for the *banana* in a dwarf state; a state the Chinese have the art of reducing most plants to; but now, after repeated examination for many years, I find it is undoubtedly a permanently distinct species. It resembles the *banana* and *plantain* in habit, and in its perennial root.

Stem erect, generally three or four feet high, and about as thick as a man's arm. Like the other species they perish soon after fructification, and like them, are succeeded by shoots from the root. *Leaves* linear, &c. as in M. *Sapientum*. *Spadix* erect. *Spathes* linear-oblong, boat-shaped, erect, obtuse, both sides smooth, and of a bright scarlet colour; all are permanent, and embrace one, or at most two flowers. *Flowers*, the inferior ones are female-hermaphrodite and fertile. The superior ones male-hermaphrodite and abortive. With Gærtner I consider the corol as two-petalled in this genus, (and not as a nectary;) and in this species it is particularly so. In M. *Sapientum* the two ovate scales over the inside of the fissures of the exterior petal may be called *nectarial*. *Petals* two, as long as the stamens, somewhat ringent ; the *exterior* one involving the interior like a spathe, its apex three-parted ; the lateral divisions thereof ending in a slender hornlet ; the middle one is broader and three-parted ; soon after expansion they become reflected, then revolute. *Interior* petal nearly as long as the exterior, apex sometimes entire, sometimes three-parted. *Filaments* uniformly five, surrounding three-fourths of the style. *Anthers* in the male-hermaphrodite flowers linear, about as long as the filaments, with a deep polliniferous groove on each margin ; those of the fertile, or female-hermaphrodite flowers are small, and totally destitute of pollen. *Germ* inferior, oblong, three-celled, &c. *Style* as long as the stamens. *Stigma* oval, obscurely three-lobed. *Pericarp* of the male-hermaphrodite flowers abortive, of the female-hermaphrodite ones fertile, oblong, and a little compressed, pulpy, about two inches long, and less than one broad, when ripe yellow, divided internally into three cells, with a double row of seeds in each, these seeds however rarely come to maturity here.

I. 666

The plant is highly ornamental, which so far as I know, is all that can be said in its favour.

3. M. *ornata. R.*

Spadix erect ; *spathes* deciduous, three-flowered, lanceolate. Both petals of the corols

Page Carey Ed. equal in length.

Beng. Ramanigee-kula.

A native of Chittagong, where this and some other sorts are commonly called monkeys' plaintains. Except in size and manner of flowering, the species does not in any respect differ from the common cultivated sorts already well known. In the Botanic garden at Calcutta, they blossom and ripen their seeds the whole year.

Root perennial, pushing forth a succession of stems every way like those of the cultivated sorts, only about as thick as a man's arm, and in general, in a rich soil from three to five feet high. *Leaves* petioled, &c. as the common plantain. *Spadix* erect. *Spathes* partial, alternate, boat-shaped, broad-lanceolate, obtuse, smooth, striated, colour a most lovely light purple or lilac, two or three-flowered, deciduous, length from four to six inches. *Flowers*, the inferior five or six spathes are occupied by female-hermaphrodite ones; all the rest, and they are very numerous, by male-hermaphrodite ones, all are orange-coloured. *Corol* two-petalled, the exterior one irregularly five-toothed, the lateral segments with calcarate apices. I. 667 The *inner* petal is as long as the exterior one, thin, and membranaceous. *Filaments* five, in some flowers there is the minute rudiment of a sixth. *Anthers* in the male-hermaphrodite flowers linear, as long as the filaments, in the female ones most minute and abortive. *Germ* inferior, in the female-hermaphrodite flowers large, and linear-oblong, with three most distinct cells, &c. in the male one minute. *Style* in the former twice as long as the filaments, with a large clammy *stigma;* in the latter shorter than the stamens, very slender, and with scarcely any *stigma* at all. *Berry* linear-oblong, slightly incurved, obscurely four or five-sided, with the angles much rounded, smooth, fleshy, when ripe dull yellowish green, about the size of a man's little finger, three-celled. *Seeds* many in a single row in each cell, compressed, tending to be quadrangular, tubercled, very black, inserted into the soft fleshy partitions. *Perisperm* and *embryo* as in the former species.

A very pretty ornamental plant, and would no doubt be much admired in Europe.

4. M. *superba. R.*

Root fibrous and perishing with the short conical stem. *Leaves* petioled, but not sheathing. *Spadix* nodding. *Spathes* cordate, many-flowered, those of the female-hermaphrodite flower permanent.

A native of the vallies of the southern parts of the peninsula of India. From Dindigul Dr. Anderson of Madras received it into his garden, and from thence introduced into the Botanic garden at Calcutta, where the plants thrive, blossom, and ripen their seeds at various times of the year.

Trunk almost conical, being only three feet to the leaves, seven and a half in circumference close to the ground, and four and a half immediately under leaves; and invested with the numerous, somewhat stem-clasping bases of those that have decayed; height of the whole plant to the highest part of the curvature of the spadix, thirteen feet. *Leaves* numerous, I. 668 equally surrounding every part of the stem, petioled, lanceolate, very entire, until broken by wind, &c. filiform, pointed, smooth on both sides, with numerous parallel, diverging veins; from five to ten feet long, and from two to three broad. *Petioles* about two feet long; those of the lower leaves have their bases broad and embrace the stem; while those near the inflorescence have long, stem-clasping sheaths, like those of the *plantain* and *banana;* semicylindric on the under side, and deeply channelled on the upper one. *Spadix* terminal, simple, drooping, before any of the spathes expand, cordate. *Spathes* numerous, expanding in succession, broad-cordate, slightly ribbed, smooth, ferruginous, many-flowered, permanent, and not becoming revolute. *Flowers* numerous, from twenty to thirty in a double series to each spathe; the *female-hermaphrodite* ones occupy the bases, or lower spathe; and the *male-hermaphrodite* ones the superior. *Perianth* none. *Corol; petals* two, very unequal. *Exterior petal* involving the inner one like a spathe, leathery, three-parted; the linear divisions often adhering by their margins; soon after expansion they become twisted into one body. *Inner petal* five or six times shorter than the exterior one, pale-coloured, almost pellucid, and composed of two sub-rotund lobes with an ensiform process between them; from the inside of the insertion of this petal a very large quantity of transparent jelly is discharged. *Nectary* two filiform scales inserted over the two fissures of the exterior petal. Thus far the male and female-hermaphrodite flowers agree. *Filaments* five, with the rudiment of a sixth on the under side. *Anthers* in the male-hermaphrodite flower longer and thicker than the filaments. In the female-hermaphrodite they are wanting, or only small, black, withered points. *Germ* beneath. In the female-hermaphrodite flower large, three-celled, and fertile; in the male one small, and barren. *Style* linear, thick, and fleshy. In the female-hermaphrodite flower twice as long as its barren stamens. In the male-hermaphrodite one only half the length of the fertile stamens. *Stigma* in both somewhat three-grooved, and obscurely six-lobed, clammy. *Pericarp; berry* oblong, size of a goose-egg, smooth, three-celled, when ripe nearly dry, so little pulp is 1. 669 there on the fruit of this species. *Seeds* numerous, angular, and black. *Perisperm* and *embryo* as in the former species.

5. M. *glauca. R.*

Root fibrous, and perishing with the columnar stem. *Spadix* drooping; *spathes* ovate-lanceolate, imbricated, from ten to twenty-flowered, permanent; those of the male-hermaphrodite flowers withering.

A very stately, elegant, perfectly distinct, strongly marked species, a native of Pegu, and from thence introduced, by the discoverer, Mr. F. Carey, into the Botanic garden at Calcutta, where it blossoms in May, and the seeds ripen in October and November. Like my M. *superba* it never produces suckers, consequently it must be reared from the seed, which

it furnishes in great abundance ; the fruit containing little else, even fit for a monkey to eat. The whole plant has a pale glaucous appearance, which, with its columnar stem and total want of suckers, readily distinguish this from all the other *Musæ* known to me. Page Carey Ed.

Root fibrous, about triennial, for like that of my *superba*, it perishes with the plant, when it has perfected its seed, and not like the cultivated sorts, tuberous, permanent, and furnishing a succession of suckers, by which they are quickly and abundantly propagated. *Stem* simple, erect, columnar, from ten to twelve feet high and about two feet in circumference. *Leaves* numerous round the apex of the stem, &c. as in M. *Sapientum*. *Spadix* in this species rather long-peduncled, perfectly pendulous, base occupied with fertile female-hermaphrodite flowers, which are completely hid under the permanent, ovate-lanceolate spathes; the barren or male-hermaphrodite flowers occupy all the rest to the very apex, and continue to blosson in succession until the seeds are ripe, by which time this part greatly exceeds in length the fertile part, and continues covered with the withered, but permanent spathes. *Corol, stamina*, and *pistillum*, as in M. *Sapientum*, &c. *Berries* trigonally clavate, as thick as a cucumber, and about four or five inches long, smooth, striated lengthways with small veins, colour when ripe a mixture of green, yellow and pink, three-celled. *Seeds*, rather *nuts*, a few in each cell, oval, size of a field bean. *Integument* a perfect, hard, black, substantial nut, divided into three transverse cells, the uppermost and lowermost filled with spongy matter, the middle one is occupied by the friable white *perisperm*, in the middle of the base thereof is lodged the small, simple, short, sub-obconic embryo, the whole nearly as in *Gærtner's Sapientum, Carp.* i. 28. *t.* 11. *f.* 1. I. 670

HELICONIA. Schreb. gen. N. 403.

Spathes alternate. *Calyx* none. *Corol* six-petalled. *Nectary* one-leaved. *Germ* inferior, three-celled ; *cells* with one or more seeds ; *attachment* inferior. *Pericarp* three-celled, three-valved, seed solitary, or several.

1. H. *buccinata. R.*

Stemless. *Leaves* lanceolar, glossy. *Spadix* central, flexuose, pubescent ; *spathes* from six to eight, bifarious, diverging, each embracing from six to ten pedicelled flowers. *Nectary* oblong ; *cells* of the germ one-seeded.

Folium buccinatum. *Rumph. Amb.* v. 141. *t.* 62. *f.* 2.

From Amboyna plants were brought to the Botanic garden at Calcutta, in 1798, where in seven years they began to blossom during the hot season, viz. April and May ; but have not yet ripened their seed in Bengal.

Root consisting of numerous, strong, fleshy fibres, like the common *banana*, and still more permanent than in any species of *Musa* known to me. *Stem* no other than the united sheathing part of the petioles, except when in flower the scape then rises through their centre. *Leaves* in numerous bundles from the same root, forming an immense, beautiful bush ; bifarious, petioled, lanceolate, entire, polished, acute, with diverging veins, from two to four feet long, and one foot broad. *Rib* protuberant, and pale. *Petioles* from three to six feet long, the lower half sheathing, those within smooth in every part. *Scape* rising through the centre of the sheathing of the petioles, and elevated but little above them. *Spadix* about a foot long, flexuose, hairy, compound, of from six to ten, alternate, bifarious branches. *Spathes* from six to ten, alternate, bifarious, diverging, smooth, lanceolate, boat-shaped, each embracing a small raceme, of from six to twelve, pedicelled, pretty large, pale yellow flowers, which expand in succession. *Bractes* numerous, bifarious, imbricated, linear-lanceolate, acute, villous, each of the most inferior ones embraces a single flower ; the superior ones are smaller and abortive. *Calyx* none, except what I take for the corol be so called. *Petals* from six to three interior, and three exterior, unequal in breadth, but of the same length, linear-lanceolate, all united at the base. *Nectary* or sterile-stamen, a single, oblong, acute leaflet, inserted on the base of the largest of the three exterior petals, and into this petal no stamen is inserted. *Filaments* five, inserted on the base of the petals on the inside. *Anthers* linear, erect, with their apices nearly as high as the stigma. *Germ* pedicelled, inferior, three-sided, three-celled, with one ovulum in each, attached to the bottom of its cell. *Style* nearly as long as the petals. *Stigma* simple. I. 671

ACHYRANTHES. Schreb. gen. N. 404.

Calyx five-leaved, and calycled. *Corol* none. *Nectary* and *stigma* various. *Germ* superior, one-celled, one-seeded ; *attachment* inferior. *Capsule* utricular, one-seeded. *Embryo* annular, with central perisperm.

1. A. *incana. R.*

Annual, erect, hoary. *Leaves* lanceolar. *Spikes* panicled, terminal. *Nectary* ten-toothed.

Illecebrum *javanicum. Willd. spec.* i. 1205. I.

Iresine *javanica. Burm. Ind.* 212. (by mistake 312.) *tab.* 65. *f.* 2. 672

Found wild in various parts of India, in flower, and with ripe seed most part of the year.

Stems nearly erect. *Branches* few, and nearly erect, all the most tender parts very-hoary, indeed white ; general height from three to five feet. *Leaves* alternate, sub-sessile, narrow-lanceolate, entire, hoary. *Panicles* terminal, composed of alternate, sessile, incurved, cylindric *spikes*, completely crowded with numerous, small, white flowers. *Calycle* two

Page Carey Ed. or three, broader, smooth, hyaline scales. *Calyx* five-leaved; *leaflets* lanceolate, hyaline, very woolly toward the base on the outside; three of the five rather narrower, and with a little green in the centre. *Nectary* a short, ten-toothed cup round the germ. *Filaments* no other than the teeth of the nectary. *Anthers* could not be detected, yet the seeds are fertile. *Germs* superior, obcordate, one-celled, one-seeded. *Style* short. *Stigma* two-cleft; *segments* hairy, and recurved in opposite direction. *Utriculus* an entire, one-celled membrane. *Seeds* solitary.

Obs. From the above description it appears evident that this plant is clearly an *Achyranthes;* having the entire membranaceous utricular capsules of that genus, containing a single, lenticular, reniform, highly polished seed, with central perisperm, and peripherical embryo.

2. A. *aspera. Willd. spec.* i. 1191,

Biennial, sub-erect, ramous. *Leaves* opposite, obovate, downy. *Spikes* most long, with flowers retrofracted.

Beng. Chichiria, Apang.

Cadelari. *Rheed. Mal.* x. 155. *t.* 78.

Amaranthus spicatus zeylanicus, foliis obtusis. *Burm. zeyl.* 16. *t.* 50. *f.* 3.

A troublesome weed in every part of India, chiefly during the rainy and cold season,
I. but in some measure all the year.

673 3. A. *aquatica. R.*

Herbaceous, straggling to a great extent about the edges of sweet water. *Leaves* opposite, lanceolate. *Spikes* terminal. *Flowers* retrofracted. *Bractes* and *scales* of the calyx spinous.

Celosia *spinescens. Koen. Mss.*

A native of Coromandel, where it blossoms during the rainy season.

4. A. *Monsoniæ. R.*

Tetrandrous, cespitose, very ramous. *Leaves* subulate, tufted; *spikes* terminal, subcylindric.

Illecebrum *Monsoniæ. Linn. Suppl.* 161.

Celosia *Monsoniæ. Retz. Obs.* 2. *p.* 13. *Willd. spec.* i. 1200; and *Ait. kew.* i. 288.

Amaranthoides spicatum Spergulæ foliis. *Pluck. Almag. Mantiss.* 11. *t.* 334. *f.* 4. *Almath.* 13. *t.* 357. *f.* 4.

A native of Bengal and Coromandel, where it blossoms during the cool season.

Stem none, but numerous branches, with opposite, diverging, round, somewhat woolly branchlets, spreading close on the ground and extending to from one to three feet in length.

Leaves subulate, opposite, sessile, with tufts of smaller ones in their axills. *Spikes* terminal, ovate-oblong, compact, being closely covered with numerous, minute, rose-coloured flowers. *Calyx* and *calycle* seven-leaved. *Nectary* four-leaved, alternate with the stamens. *Stamens* four. *Utricules* with a single seed.

5. A. *lappacea. Willd. spec.* i. 1192.

Biennial, straggling. *Leaves* opposite, petioled, ventricose-oblong, smooth. *Spikes* terminal; *flowers* remote, generally in pairs, with three fascicles of coloured, hooked bristles to the pair.

I. Willia-codiveli. *Rheed. Mal.* x. 117. *t.* 59.

674 Blitum scandens, fructu lappacco. *Burm. Zeyl.* 47. *t.* 18. *f.* 1. (good.)

Beng. Kuya-duya. Duya-kuya.

Is found in most parts of India, generally growing among bushes. Flowering time the rainy season.

6. A. *alternifolia. Herb. Banks.*

Annual, diffuse. *Leaves* alternate, ovate-oblong. *Spikes* axillary, longer than their leaves, two variously horned bodies between the corol and calyx. *Nectary* none.

Beng. Luta-mohooriya, Gungatiya.

Teling. Chancheli kura.

Annual, common on most cultivated lands, in the Botanic garden at Calcutta; it is a most troublesome weed.

Stem when the plant is young, tolerably erect, but ever afterwards prostrate, with longer, prostrate, striated, succulent branches. *Leaves* alternate, petioled, oblong, or ovate, pointed, sometimes a little waved, margins coloured; below a little hairy, about two inches long. *Petioles* Channelled. *Spikes* axillary, twice as long as the leaves or more. *Flowers* solitary, alternate, small, red. *Bractes* three-fold, concave, one-flowered; immediately within each of the two lateral bractes is a compressed, ramous, green body. *Calyx* five-leaved; the inner segments three-coloured. *Nectary* no other than the enlarged bases of the filaments. *Seed* single, in its rugose utriculus.

The leaves and tender tops are used by the natives in their curries. It ought to be carefully compared with A. *muricata.*

7. A. *prostrata. Willd. spec. i.* 1194.

Annual, diffuse. *Leaves* opposite. *Spikes* filiform. *Flowers* reflexed, with fascicles of bristles adjoining. *Nectary* with five bidentate horns, alternating with the filaments.

Scheru-cadelari. *Rheed. Mal.* x. 157. *t.* 79.

I. Auris canina femina. *Rumph. Amb.* vi. 26. *t.* 11.

675 Introduced into the Botanic garden at Calcutta, amongst spice plants from the Moluccas. Flowers during the cold season.

Root ramous, annual. *Stem* scarcely any, but several pairs of opposite, diffuse, round,

smooth. coloured branches. *Leaves* opposite, sessile, oblong, entire, coloured. *Spikes* terminal, solitary, filiform, sub-erect. *Flowers* scattered, reflected, generally two together. *Bractes* (or calyx) three to the two flowers, with the same number of fascicles of hooked red bristles as in A. *lappacea*. *Nectary* with five, two-toothed hornlets, alternate with the filaments, and with them united into a membranous ring round the base of the germ. *Germ* sub-pedicelled. *Style* single. Page Carey Ed.

8. A. *sericea. Koen. Mss.*

Stem erect, downy. *Leaves* opposite, broad-lanceolate, covered with much silky down. *Peduncles* axillary, longer than the leaves, bifid or trifid, many-flowered.

A large, straggling annual, growing in sheltered shady places in a dry sandy soil.

Root single. *Stem* erect, with many long spreading branches resting on the ground, or something else; all are round, and covered with silky down. *Leaves* opposite, petioled, broad-cordate, acute, covered with very soft silky down, about an inch and a half long. *Peduncles* axillary, opposite, round, downy, as long as the leaves, each ending in two, three, or more, spreading, winding filiform spikes. The rest as in the genus.

9. A. *ferruginea. R.*

Annual, flaccid. *Leaves* opposite, ovate. *Spikes* sub-conical, peduncled and sessile. *Nectary* five-toothed; each tooth ending in a proper antheriferous filament. *Stigmas* entire.

Beng. Rukta-Sirinchee.

Hind. Lal-Sirinchee. I. 676

A small annual, wild in gardens, or about the borders of cultivated lands near Calcutta, where it appears during the rainy season.

Stems slender, leaning, about a foot long, absolutely four or five-sided, smooth, rust-coloured. *Branches* opposite, and like the stem. *Leaves* opposite, short-petioled, oval or obovate, entire, smooth, of a very soft texture, reddish, about an inch long. *Spikes* peduncled, or sessile, small, conical. *Peduncles* four-sided, length various. *Bractes* in general two, opposite, leaf-like, but much smaller. *Flowers* crowded, small, dull red. *Calycle* three-leaved, the two lateral ones falling off with the five-leaved calyx and seed; the third or undermost one remains. There may be an impropriety in calling these the calycles. *Nectary* cup-shaped, five-toothed, teeth lengthened into five filaments. *Stigma* simple. *Seed* solitary, in a membranaceous utriculus.

10. A. *scandens. R.*

Perennial, climbing, downy. *Leaves* alternate, oblong-ventricose. *Spikes* axillary, solitary, sessile. *Calyx* hairy. *Nectary* ten-parted. *Stigma* two-lobed.

Beng. Nooriya.

A native of hedges, &c. near Calcutta; in flower about the close of the rains.

Stems and *branches* climbing, below woody, perennial; young parts more or less hairy. *Leaves* alternate, short-petioled, oblong, a little ventricose, hairy, and of a soft texture; size very various. *Spikes* sessile, axillary, and terminal; those from the axills small, and solitary; while the terminal ones are large, and generally three or more of them together. *Calyx* and *calycle* silver-coloured, and woolly. *Nectary* ten-toothed; *teeth* equal, alternately antheriferous. *Style* single. *Stigma* two-lobed. *Capsules* circumcised, containing a single, black, smooth reniform seed.

11. A. *lanata. R.* I. 677

Annual, erect, ramous, woolly. *Leaves* alternate, orbicular. *Spikes* crowded. *Nectary* ten-parted, alternately antheriferous. *Stigmas* two-cleft.

Illecebrum *lanatum. Willd. spec.* i. 1204.

Scheru-bula. *Rheed. Mal.* x. 57. *t.* 29. (good.)

Chenopodium incanum, racemosum, folio majore minori opposito. *Burm. Zeyl.* 60. *f.* i. (good.)

Beng. Chaya.

Is common every where, both on the Coast of Coromandel and Bengal.

A stout, hardy, annual plant, from one to two feet high, flowering all the year round. *Stems* erect, with many ascending, woolly branches. *Leaves* alternate, petioled, roundish, with somewhat of a point, and tapering at the base, entire, woolly both sides; size very various. *Calyx* woolly. *Nectary* ten-toothed, as in A. *scandens*. *Spikes* axillary, oval, woolly. *Stigma* two-lobed. *Capsules* with a single, smooth, shining black, reniform seed.

Obs. The late edition of the *Spec. Plant.* by Reichard, makes this plant an *Illecebrum*; for what reason I know not.

12. A. *diandra. R.*

Annual, diffuse. *Leaves* opposite, linear-lanceolar. *Spikes* terminal; *flowers* reflected, and pressed close to the rachis. *Stamina* two, alternate with the two multifid lobes of the nectary.

A native of Ceylon.

Root fibrous, annual, or at most biennial. *Stems* slender, straggling, striated, clothed with a few hairs pointing forward. *Leaves* opposite, short-petioled, linear-lanceolate, entire, nearly smooth. *Spikes* terminal, solitary, simple, long, and slender. *Flowers* solitary, small, after blossoming reflected back close to the rachis. *Bractes* (calyx?) three-leaved. *Calyx* of five, rigid, smooth tapering, acute leaflets. *Nectary* two-lobed; *lobes* finely and deeply multifid. *Filaments* two, one in each fissure of the nectary, half as long as the corol. *Anthers* incumbent. *Utriculus* turbinate. *Seed* solitary.

13. A. *triandra. R.* I. 678

Page Carey Ed.

Annual, creeping. *Leaves* opposite, sessile, lanceolate, smooth. *Flowers* triandrous. *Capsules* winged.

Illecebrum sessile. *Willd. spec.* i. 1209.

Coluppa. *Rheed. Mal.* x. 21. *t.* 11.

Amaranthus humilis foliis oppositis, flosculis in alis conglomeratis. *Burm. Zeyl.* 17. *t.* 4. *f.* 2. (good.)

Telinga. Ponagunta-kura.

Sans. Shalanchi.

Beng. Shanchi, also shalooncha.

A native of Bengal where it is a common weed during the rainy season.

14. A. *nodiflora. R.*

Annual, diffuse. *Leaves* obovate, cuneate. *Spikes* globular. *Nectary* with only five, antheriferous divisions. *Stigma* simple.

Celosia nodiflora. *Willd. spec.* i. 1202.

Amaranthoides indicum, nodiflorum capitulis exalbo viridescentibus. *Burm. Zeyl.* 16. *t.* 5. *f.* 2.

A native of Coromandel. Flowers in the cold season. The ovarium in this plant contains but a single ovulum, attached to the bottom of its single cell, consequently its place is in this genus to which I have transferred it.

CELOSIA. Schreb. gen. N. 405.

Calyx five-leaved and calycled. *Corol* none. *Nectary* stamiferous, surrounding the base of the ovarium. *Germ* one-celled; *ovula* several, attached to the bottom of the cell. *Capsules* opening transversely and containing more seeds than one. *Embryo* annular, with a central perisperm.

I. 679 1. C. *argentea. Willd. spec.* i. 1197.

Erect, annual. *Leaves* from lanceolate to oblong. *Spikes* sub-cylindric, scariose. *Nectary* with five, short toothlets, alternate with the long antheriferous divisions.

Beng. Shwet-moorga.

Hind. Debkotee.

Tsjeria-belutta-adeka-manjen. *Rheed. Mal.* x. 77. *t.* 39.

Belutta-adeka-manjen. *Ibid.* 75. *t.* 38. I take for the same plant in its wild state; at least the wild plants of *argentea* found in the corn fields of India, are more stunted in their growth, but have their leaves broader, and the spikes shorter, as in the figure just quoted; and I am inclined to think Willdenow's *albida*, consequently Burman's *pyramidalis*, can, at most, be reckoned only another variety of the same species. Plants from the same seed have leaves of very various breadth, and are as often with, as without the falcate stipules.

2. C. *cristata. Willd. spec.* i. 1198.

Annual, erect. *Leaves* oblong-ovate, peduncled, round, striated. *Spikes* oblong.

Beng. Lal-moorga, the red variety; Huldee-moorga, the yellow.

Amaranthus vulgaris. *Rumph. Amb.* v. 236. *t.* 84.

I have never been able to find any other species or variety in India, that I could refer to C. *coccinea.* I cannot consider the breadth of the leaves, nor falcate stipules, to be any more characteristic in this than in *argentea* and its varieties.

In gardens only throughout India, and thrives best during the rainy and cold seasons.

3. C. *comosa. Willd. spec.* i. 1198.

Erect, annual. *Leaves* lanceolate. *Spikes* cylindric, tufted.

Found in most parts of India in gardens, and like the last thrives best during the rainy
I. and cold seasons.

680 4. C. *cernua. R.*

Annual, erect, ramous. *Leaves* lanceolate, acute. *Racemes* terminal, cylindric, with long sterile, ramous, pendulous tails. *Capsules* operculed, many-seeded.

A native of the tops of the Rajmuhal hills, where Mr. W. Roxburgh first found it in great abundance wild amongst fragments of a rich iron ore, and from thence sent the seeds to the Botanic garden at Calcutta, where it grows well and continues in gaudy blossom, during the whole of the cold season.

Root annual. *Stem* erect, with numerous, ascending, ramous branches, slightly striated, colour from green to a deep liver colour. *Leaves* alternate, lanceolate, acute, smooth, entire, from one to six inches long, and broad in proportion. *Stipules*, or rather the lower opposite pair of leaves of the branches and branchlets often present, and then falcate, as in C. *argentea*, &c. but I do not think their presence or absence can, in any of the species found in India, be taken into the specific character; for in some plants they are tolerably constant, whereas in others of the same species reared from the same seed no sign of them can be traced. *Racemes* terminal; the fertile flower-bearing part simple, cylindric, but curved from the weight of the long, pendulous, lovely crimson, sterile panicle into which they divide, and which gives to this charming species its great beauty. *Flowers* numerous, short-peduncled, before and during expansion of a bright, vivid purple colour, but as the seed advances to maturity the margins of the scales become pure white, more or less broad. *Bractes* tapering, acute, one larger under the base of the pedicel, and two on its apex, pressing the calyx laterally, and about half its length. *Calyx; leaflets* dagger-pointed, rather longer than the stamina. *Nectary* ten-part-
I. ed, the five long, subulate, alternate ones are antheriferous, the other five short and incurv-
681 ed over the germ. *Stigma* slightly three-lobed. *Capsules;* the lid is a little scabrous and

marked with five elevations. *Seeds* several, shining black. Page Carey Ed.

This species appears to me to differ from Retz. *comosa* in the following points: 1*st*. Here the stamina and style are about the same length, and rather shorter than the calyx; there twice as long. 2*d*. Here are many, about eight seeds in the capsules; there only two.

5. C. *corymbosa. Willd. spec.* i. 1200.

Perennial, erect. *Leaves* opposite and fascicled, linear. *Corymbs* terminal. *Calyx* five-leaved. *Corol* five-petalled, no nectary. *Capsules* one-celled, three-valved; *seeds* many.

Paronychia foliis ad genicula confertis, acutis, floribus umbellatis. *Burm. Zeyl.* 184. *t.* 65. *f.* 2.

Telinga. Rajuma.

Is a native of dry sandy lands. Flowers all the year round. This would better form a separate genus than a species of *Celosia;* probably it is one of Jussieu's *Caryophylleæ.*

Root perennial. *Stem* straight, frequently branchy, round, jointed, reddish, covered with white down; about a foot high. *Leaves* opposite, sessile, linear, spreading, with fascicles of many smaller leaves in their axills. *Stipules* generally four-fold, ensiform, membranaceous. *Umbels* terminal, dichotomous. *Calyx* five-leaved; *leaflets* lanceolate. *Nectary,* or rather *corol,* of five, obcordate petals, alternate with the stamens. *Filaments* inserted, alternate with the petals. *Style* short. *Stigma* three-lobed. *Capsules* three-sided, one-celled, three-valved, opening from the apex. *Seeds* from six to twelve or more, round.

Cattle are not found of this species.

6. C. *polysperma. R.* I. 682

Annual. *Leaves* oblong, smooth. *Spikes* axillary. *Nectary* with only five antheriferous divisions. *Style* three-cleft. *Capsules* bacciform, evalvular, many-seeded.

A native of the Moluccas. It is an erect, smooth annual, with long, delicately thin leaves.

DEERINGIA. Brown. prodr. nov. holl. i. 413.

Calyx five-leaved. *Corol* none. *Filaments* having their base united into a little cup. *Germ* one-celled, many-seeded; *attachment* inferior. *Berry* one-celled. *Seeds* a few, attached by their proper cords to the bottom of the cell.

1. D. *celosioides. Brown. loc. cit.*

Perennial, scandent. *Leaves* alternate, cordate. *Spikes* terminal, panicled. *Styles* three. *Berries* three-seeded.

Celosia baccata. *Koen. in Retz. Obs.* 5. 23.

Blitum fructescens. *Rumph. Amb.* v. 235. *t.* 83. *f.* 2.

Beng. Gola Mohunee.

Hind. Lutmun.

Found near Calcutta, flowering in the rains.

Root nearly spindle-formed, large, perennial. *Stems* and *branches* one, two, or more fathoms long; perennial, climbing, striated, otherwise smooth. *Leaves* alternate, petioled, cordate, acute, entire. *Spikes* panicled, terminal, and from the exterior axills long, ascending. *Flowers* numerous, distinct. *Calycle* three-leaved, bractiform. *Filaments* five, from the nectary; *anthers* two-lobed. *Styles* three.

In January I found a very large plant of this climbing over a small tree, of about sixteen or eighteen feet high, with few leaves, but innumerable, beautiful, pendulous racemes loaded with small, smooth, bright red berries, each contained when perfect, three small, black, flattened, roundish, kidney-shaped seeds in one distinct cavity of the berry.

2. D. (formerly *Celosia. R.*) *tetragyna. R.* I. 683

Shrubby, scandent. *Leaves* ovate-cordate. *Flowers* axillary. *Styles* four-cleft.

A native of the Moluccas, and from thence accidently introduced into the Botanic garden at Calcutta, amongst spice and other plants; flowering time in Bengal, the cold season.

Stem ligneous, scandent; *young shoots* pendulous, striated, smooth. *Leaves* alternate, petioled, ovate-cordate, acuminate, somewhat undulate, smooth on both sides; about two inches long, and one broad. *Petioles* channelled. *Flowers* axillary, from solitary to the being collected on small short-peduncled heads; they are small and of a pale-greenish white colour. *Calyx* (I would in this species rather say *bractes,*) three-leaved. *Corol* (rather *calyx*) five-leaved; *leaflets* obtuse, and about as long as the stamens. *Nectary* with four or five, lengthened, antheriferous divisions. *Germ* four-lobed. *Styles* four, recurved. *Berry* with from one to four lobes, smooth, when ripe red, succulent, size of a pea, containing from one to four reniform seeds, though one is by far the most common.

PAEDERIA. Schreb. gen. N. 412.

Calyx five-toothed. *Corol* tubular. *Germ* two-celled, one-seeded; *attachment* inferior. *Stigma* two-cleft. *Berry* inferior, two-seeded. *Embryo* erect, and furnished with a perisperm.

1. P. *fœtida. Willd. spec.* i. 1219.

Shrubby, twining. *Leaves* oblong-cordate. *Panicles* axillary and terminal. *Stamina* inclosed. *Berries* compressed.

Somaraji. *Asiatic Res.* iv. 261.

Beng. Gundha badhulee.

Hind. Gundali.

Convolvulus *foetidus. Rumph. Amb.* v. 436. *t.* 160.

Apocynum *foetidum. Burm. Ind. p.* 71. I. 684

Page Carey Ed. Is rather a rare plant, I have only found it in the vicinity of Calcutta, twining up and over trees, &c. Flowering time the beginning of the cold season. Its root is used by the Hindoos as an emetic.

Stem ligneous, twining; *young parts* round, smooth. *Leaves* opposite, long-petioled, oblong-cordate, pretty smooth, entire. *Stipules* broad-cordate. *Panicles* axillary and terminal, brachiate. *Flowers* numerous, of a deep pink colour. *Bractes* ovate. *Calyx* five-toothed. *Corol; tube* pretty long, somewhat gibbous, inside woolly. *Border* narrow, divided into five cordate, crenulate segments. *Filaments* short, inserted irregularly about the middle of the tube. *Anthers* erect, within the tube. *Germ* inferior, turbinate, two-celled; *cells* containing one ovulum each, attached to the bottom of the cell. *Style* single. *Stigma* two-cleft; *segments* various, bent amongst the anthers. *Berry* dry, compressed, smooth, with five lines on each side; one-celled, two-seeded. *Seeds* compressed, smooth, enlarged with a somewhat membranaceous ring all round. *Perisperm* conform to the seed, but scanty. *Embryo* large, erect. *Cotyledons* round, cordate. *Radicle* short, inferior.

2. P. *recurva*. *R.*

Shrubby. *Leaves* lanceolar, acuminate. *Corymbs* terminal, recurved.

A slender shrubby species; a native of Chittagong, where it is chiefly found in moist situations amongst the hills, flowering in the hot season. The seeds ripen in October and November.

Stem and *branches* erect; *young shoots* round, and smooth. *Leaves* opposite, short-petioled, lanceolar, entire, acuminate, pretty smooth on both sides, about six inches long, and from two to three broad. *Stipules* as in the other *rubiaceæ*, with a subulate, hairy point.
I. 685 *Corymbs* terminal, recurved, brachiate, villous. *Bractes* opposite, ensiform. *Calyx* five-cleft, hairy; *segments* conic, permanent. *Corol* funnel-shaped. *Tube* the length of the border, widening to the mouth, a little hairy on the outside. *Border* of five, contorted, obliquely oblong segments. *Filaments* scarcely any. *Anthers* five, linear, erect, attached below the middle to the mouth of the tube of the corol, and their lower ends in it. *Germ* hairy, two-celled, with one *ovulum* in each, attached to the partition a little above its middle. *Style* the length of the tube of the corol. *Stigma* simple, linear-clavate, longer than the stamina. *Berry* inferior, size and colour of a black currant, when dry striated, crowned with the remaining calyx, two-celled. *Seeds* solitary, the outside convex; on the inside a deep pit filled with the spongy receptacle. *Integument* single, thin. *Perisperm* conform to the seed, hard, dull white. *Embryo* lodged in the middle of the convexity of the seed. *Cotyledons* reniform. *Radicle* inferior.

3. P. *erecta*. *R.*

Shrubby, erect. *Leaves* sub-sessile, broad-lanceolar, entire. *Panicles* in the terminal forks of the branchlets, erect. *Stamina* protruded.

An erect, shrubby plant; a native of the Silhet district. It flowers in May and June; and the seeds ripen about the end of the rainy and beginning of the cold season.

Stem short, erect. *Bark* smooth, ash-coloured. *Branches* round, smooth, and dichotomous. *Leaves* opposite, sub-sessile, broad-lanceolar, entire, smooth, ribbed with parallel veins underneath; from three to four inches long, by one and a half broad. *Stipules* interfoliaceous, as in other *rubiaceæ*. *Panicles* solitary in the fork of the branchlets, often longer than the leaves; thin, being composed of a few small, short, opposite ramifications. *Flowers* small, numerous, white, inodorous. *Calyx* superior, short, slightly five-toothed. *Corol* with
I. a short tube which is woolly on the inside; *segments* of the border oblong. *Filaments* short,
686 inserted on the tube of the corol. *Anthers* oval, scarcely exsert. *Germ* turbinate, two-celled, with one *ovulum* in each, attached to the inner, and lower angle of its cell. *Style* the length of the tube of the corol. *Stigma* two-lobed. *Berry* inferior, the size of a pea, when ripe smooth, shining, highly polished, black, two-celled; one of the cells frequently abortive. *Seeds* solitary, with a very deep concavity on the inner or flat side. *Integument* single. *Perisperm* conform to the seed, rather hard. *Embryo* lodged in the middle of the perisperm. *Cotyledons* round, reniform. *Radicle* inferior.

GUETTARDA. Schreb. gen. N. 1437.

Calyx sub-entire. *Corol* infundibuliform, with the border from five to eight-parted. *Stamina* from five to eight. *Drupe* dry; *nut* from five to eight-celled. *Seed* solitary.

1. G. *speciosa*. *Willd. spec.* iv. 398.

Arboreous, unarmed. *Leaves* obovate. *Cymes* axillary, dichotomous. *Flowers* sessile, from seven to eight-cleft. *Drupes* with as many seeds as divisions in the border of the corol.

Jasminum *hirsutum*. *Willd.* i. *p.* 36.

Cadamba *jasminiflora*, v. *Fleur.* de St. *Thome. Sonnerat. t.* 2. *p.* 228. *t.* 128.

Rava pu. *Rheed. Mal.* iv. 99. *t.* 47, and 48.

On the coast of Coromandel, it is only to be found in gardens, where it is raised from the seed. It is in flower all the year round, and highly ornamental as well as fragrant. I am not aware that it is used for any economical purposes.

Trunk erect, straight, covered with smoothish, dark-coloured bark. *Branches* numerous, opposite, decussated, spreading, horizontal, forming a large beautiful, shady, evergreen head. *Leaves* opposite, petioled, nearly decussate, obovate, sometimes cordate at the base;
I. entire, smooth, from six to nine inches long, and from four to six broad. *Petioles* round,
687 coloured, about an inch and a half long. *Stipules* large, within the leaves, oblong, spreading. *Cymes* opposite, axillary, long-peduncled, twice two-forked. *Peduncles* round, a little inflect-

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ed, from three to four inches long. *Bractes* many, linear, obtuse, caducous. *Flowers* sessile, from fifteen to twenty on the cyme, large, white, and exquisitely fragrant, partaking much of the fragrance of cloves. *Calyx* cup-shaped, entire, permanent. *Corol; tube* cylindric, an inch and a half long. *Throat* woolly. *Border* from six to nine-cleft. *Filaments* none. *Anthers* as many as there are divisions in the border of the corol, linear, within the mouth of the tube. *Germ* inferior. *Style* a little shorter than the tube. *Stigma* nearly globose. *Pericarp* a dry drupe, nearly globose, pretty smooth, inwardly of a fibrous, woody texture, containing as many curved cells as there were anthers, or divisions in the border of the corol. *Seeds* one in each cell, much curved, concave part of the curvature outward.

Obs. I have at various times examined many hundreds of the flowers of this tree, and never found any that were hermaphrodite. It agrees better in habit and in most other respects, the seeds vessels excepted, with *Gardenia* than with any other genus I have met with.

CARISSA. Schreb. gen. N. 413.

Calyx five-toothed. *Corol* funnel-shaped. *Germ* superior, two-celled; *cells* two to four-seeded; *attachment* interior. *Berry* two-celled, few-seeded. *Embryo* inverse, and furnished with a perisperm.

1. C. *Carandas. Willd. spec.* i. 1219. *Roxb. Corom.* 77.

Sub-arboreous. *Thorns* often two-forked. *Leaves* elliptic, obtuse, smooth. *Corymbs* terminal, few-flowered. *Germ* eight-seeded.

Avinga, Krishna-pakphula, and Sanscrit names. See *Asiatic Res.* iv. 263.

Telinga Waaka.

Tam. Kalaaha. It is also thus called by Europeans on the Coromandel coast. 688

Beng. Kurumcha.

A common, large shrub; or irregularly formed small tree, growing in most wild, woody, dry, uncultivated parts. Flowering time February, March, and April. Fruit ripe in July and August.

Trunk, when it is of age to have one, irregularly bent in various directions. *Bark* gray. *Branches* and *branchlets* very numerous, always two-forked, and standing nearly at right angles, rigid, smooth, and round. *Thorns* constantly in pairs at the divisions of the branches and branchlets, and at every other pair of leaves, opposite, horizontal, very strong, smooth, and exceedingly sharp; they are frequently forked. *Leaves* opposite, nearly sessile, oval, obtuse, smooth, hard, shining; their insertions remarkably regular, generally one pair below the fork, crossed with the thorns; and another pair between the forks, where there are no spines. *Peduncles* terminal, generally in pairs, each less than an inch long, bearing from three to many, beautiful, milk-white, Jasmine-like flowers. *Bractes*, a small one at the insertion of each pedicel. *Calyx, corol* and *stamens*, as in the genus. *Germ* ovate, two-celled, with four ovula in each, attached to the thickened partition. *Berry* single, (never two, not even the rudiment of more than one,) size of a small plumb, but of a more lengthened form, when ripe of a shining black, two-celled. *Seeds* four in each cell when all come to maturity, which is uncommon; oblong, compressed, concave on the inside, from the centre of the concavity is the attachment to the large fleshy particular margins, thin. *Integument* single, *Perisperm* conform to the seed, white. *Embryo* inverse. *Cotyledons* nearly round. *Radicle* cylindric, superior.

Obs. This plant makes exceedingly strong fences. The number of their strong, sharp, thorns, renders them almost impassable. I.

The fruit just before ripe is employed to make tarts and preserves of various kinds, 689 also to pickle, and by most people reckoned superior for these uses, to every other fruit in the country, not even the *mango* excepted.

They are universally eaten by the natives when ripe, and are tolerably pleasant to the taste even of a European.

2. C. *diffusa. R.*

Shrubby, diffuse, armed branches dichotomous. *Leaves* sub-sessile, roundish-ovate-cordate, mucronate, polished. *Flowers* terminal. *Germ* four-seeded. *Berries* ovate.

Sans. Kurumudika.

Telinga. Waakoyloo.

Oorissa. San Kurunda.

Is a native of the Ganjam district, and from thence northward to the mouth of the Hoogly. Flowering time the hot season.

Stem scarcely any can be traced, but numerous, spreading, dichotomous branches, forming a low, broad, rigid, thorny bush. *Spines* opposite, &c. as in C. *Caranda*, at the larger pairs of the leaves only, horizontal, simple, bifid, or twice-bifid. *Leaves* opposite, sub-sessile, the alternate pairs always larger, and ovate-cordate, roundish, and without spines; all are entire, of a firm, polished, shining texture, each ending in a short, subulate, somewhat recurved point. *Corymbs* terminal, rarely axillary, many-flowered. *Flowers* pure white. *Calyx* five-toothed, small. *Corol* funnel-shaped; the upper half of the tube a little swelled. *Border* of five, obliquely-lanceolate divisions. *Filaments* five, inserted rather below the middle of the tube of the corol; *anthers* oblong. *Germ* ovate, two-celled, with two ovula in each, attached to the middle of the partition. *Style* half the length of the tube of the corol. *Stigma* double, the lower half nearly round, the upper half more slender, and tapering. *Berries* oval, pulpy, when ripe smooth, shining black, size of a French bean, two- I. 690

Page Carey Ed. celled, with two seeds in each. *Seeds, perisperm* and *embryo* as in C. *Carandas*.

3. C. *villosa*. *R.*

Shrubby, tender parts villous. *Leaves* from broad-lanceolate to oblong-acute. *Flowers* terminal, subtern, or seven. *Germ* four-seeded, (two in each cell.)

Several plants of this shrub have been long cultivated in the Botanic garden at Calcutta but from whence, or how they got into the garden, has never been ascertained. Flowering time the same as the other species, viz. during the warmest time of the year, March, April and May. This species seems perfectly distinct, and has much less to recommend it than either *Carandas*, or *diffusa*. In most respects it agrees pretty well with Vahl's description of C. *edulis*. The following description will, however, point out some difference.

Stem rather weak, and leaning considerably, soon dividing into several, rather slender dichotomous, flexuose branches. *Bark* of the ligneous parts spongy, and deeply cracked; that of the young shoots villous. *Thorns* opposite, at the forks of the branches, and in all other parts at every second, straight, strong, very sharp, and less frequently compound than in the other two species just mentioned. *Leaves* opposite, short-petioled, oblong, and broad lanceolate, acuminate, soft with down, particularly while young, from one to two inches long and rarely more than one broad. *Stipules* small, and only present where the spines are. *Flowers* terminal, tern, or twice tern, small, white. *Calyx; segments* lanceolate, acute, villous. *Tube* of the corol a little curved, swelled near the mouth. *Border* of five, linear-lanceolate, acute segments. *Stamina* lodged in the swelling of the tube. *Germ* conic, two-celled, with two ovula in each, attached to the partition. *Style* shorter than the tube. *Stigma* large, with a villous, bidentate apex. *Berry* round, the size of a pea, smooth, deep black purple, two-celled. *Pulp* succulent, purplish, and sweet. *Seeds* one or two in each cell, shape various, concave on the inside, convex on the exterior. *Integuments* single, light brown, and rather rough. *Perisperm* conform to the seed, white, amygdaline. *Embryo* inverse, white. *Cotyledons* roundish. *Radicle* cylindric, length of the cotyledons, superior.

I. 691

4. C. *axillaris*. *R.*

Shrubby, armed with simple, opposite, recurved spines. *Leaves* short-petioled, oblong. *Corymbs* peduncled, axillary, many-flowered.

A native of the Moluccas.

CERBERA. Schreb. gen. N. 415.

Calyx five-parted. *Corol* funnel-shaped. *Germ* two-lobed; *lobes* two-celled; *cells* two-seeded; *attachment* interior. *Drupes* superior, one or two singly, one-seeded. *Embryo* inverse without perisperm.

1. C. *fruticosa*. *R.*

Shrubby, dichotomous. *Leaves* broad-lanceolar. *Corymbs* terminal. *Drupes* obliquely urn-shaped, and gaping.

From Pegu this elegant shrub has been introduced into the Botanic garden at Calcutta where it is in constant blossom. The flower like those of *Vinca rosea*, but larger, and faintly fragrant; it is in fact one of the most ornamental shrubs in the garden.

Stem short, soon dividing, and sub-dividing into many, straight, round, smooth, dichotomous *branches* and *branchlets*. *Leaves* opposite, often remote, short-petioled, from oblong to lanceolate, entire, smooth, acuminate, about five or six inches long, and from two to three broad. *Stipules* interfoliaceous, acute. *Corymbs* terminal when they first appear; but long before the whole of the blossoms expand, a branchlet shoots forth on each side and places them in the fork; divisions sub-trichotomous and short. *Flowers* large, mouth of the tube lively red, the rest a bright lively pink, somewhat fragrant, and highly ornamental. *Bractes* opposite, triangular, acute. *Calyx* five-leaved; *leaflets* oblong, smooth, permanent, a smooth gland on the apex of each. *Corol* infundibuliform. *Tube* nearly two inches long, and equally slender, except near the apex, where it swells considerably, mouth highly coloured and hairy. *Border* of five, obovate-oblong, equal segments. *Filaments* five, short, inserted round the bottom of the swelled top of the tube. *Anthers* sagittate, entirely hid within the mouth of the tube. *Germ* two, villous, on the sides where they meet, a small subulate scale covering the fissure on each side, singly two-celled, with one ovulum in each, attached to the middle of the partition, *Style* nearly as long as the tube. *Stigma* large, with a two-lobed apex, which is lodged in the dome formed by the converging of the sagittate anthers. *Drupe* (in this rather *capsule*) generally solitary, obliquely urn-shaped, size of the first joint of the little finger, villous and veined, dark greenish purple, apex truncate, sloping much to the inner side, with a slit down the middle, semi-two-valved, opening up the inside and along the apex, one-celled. *Pulp* scarcely any, the whole substance being thin and somewhat fibrous. *Seed* solitary, ovate-oblong. *Integument* single, white, pretty thick, and soft. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, of a pale yellowish colour. *Radicle* ovate, superior.

I. 692

2. C. *Odollam. Gært. Carp.* ii. 193. *t.* 124.

Leaves alternate, lanceolate, with transverse nerves, smooth.

Corymbs terminal, divisions of the calyx linear, and revolute.

Odallam. *Rheed. Mal.* i. 71. *t.* 39. But *Manghas lactescens, Burm. Zeyl.* 150. *t.* 70. *f.* 1. is without doubt a different species, which Gærtner has considered to be C. *Manghas. Linn.*

I. 693

A pretty large tree, a native of salt swamps near the shores of various parts of India, yet it thrives well in the sweet and comparatively rich soil of the Botanic garden at Calcutta where the trees are fully as large as the largest pear trees, and in flower and seed the whole year.

The wood is remarkably soft, spongy and white, the bark on the young, generally tri- Page Carey Ed.
chotomous shoots polished, deep green. *Leaves* alternate, and crowded about the ends of the branchlets, short-petioled, lanceolar, firm and polished. *Corymbs* terminal. *Flowers* large, white and fragrant. *Bractes* and *calycine segments* linear and revolute. *Corol* infundibuliform; *segments* of the border sub-triangularly falcate, in the bud imbricated. *Stamina* enclosed. *Germ* two-lobed, each lobe with a groove on the outside, and containing two cells, with two ovula in each, attached to the partition. I never saw more than one of the lobes come to maturity, and that with rarely more than one seed, the other cell proving abortive. The style is slender, and the stigma in this species is remarkably large, conical, resting in a saucer-shaped receptacle, the circumference fluted with ten grooves, and the apex two-cleft. *Gærtner's description and figures of the mature seed vessel and seed, are so good as to render any thing further unnecessary.*

3. C. *maculata. Willd. spec.* ii. 1223.

Leaves sub-verticelled, oblong, tapering most toward the base, smooth, veined. *Drupes* acuminate.

Ochrosia. *Jussieu. gen. plant.* 161.

Found by Colonel Hardwicke indigenous on the Island of Mauritius, in seed in September. From his specimens the above definition is taken.

OPHIOXYLON. Schreb. gen. N. 1578.

Calyx five-toothed. *Corol* funnel-shaped. *Germ* two-celled; *cells* one-seeded; *attachment* inferior. *Berries* twin, superior, slightly united, each one-seeded. *Embryo* inverse, and furnished with a perisperm. I. 694

1. O. *serpentinum. Willd.* iv. 979.

Tsiovanna-Amel-Podi. *Rheed. Mal.* vi. 81. *t.* 47.

Radix Mustela. *Rumph. Amb.* vii. 29. *t.* 16.

Sans. Chundrika, Churmuhuntree, Pushoomehunukarika, Nundunee, Karuvee, Bhudra, Vasoopooshpa, Vasura, Chundrushoora.

Beng. Chandra.

Hind. Ch'hota-chand.

Telinga. Patalganni.

This, in a rich soil, is a large climbing or twining shrub: in a poor soil, small and erect. It is a native of the Circar mountains. In my garden it flowers all the year round.

Stem woody, erect, climbing, or twining. *Bark* ash-coloured. *Leaves* three or five-fold, short-petioled, oblong, pointed, waved, entire, smooth; from four to five inches long, and about two broad. *Stipules* none. *Fascicles* axillary, peduncled, many-flowered. *Peduncles* long, smooth, round, sometimes nearly erect, sometimes drooping. *Pedicels* and *calyces* of a bright red colour, which with the white flowers, gives the fascicles a very pretty appearance.

The HERMAPHRODITE FLOWERS, indeed I never could discover any other, are well described in the *Genera Plantarum*, except that the corol is always contracted. *Germ* superior, two-lobed, with one ovulum in each, attached to the inner and lower corner of the cell. *Berry* two-lobed, smooth, shining black, and succulent when ripe; *lobes* the size of a pea, each one-celled. *Seed* solitary, somewhat trapeziform. *Integuments* two, the exterior one nuciform, most pointed at the base, hard, thick, and rugose, the inner one a fine membrane, adhering to the perisperm. *Perisperm* conform to the seed, greenish white. *Embryo* inverse, straight, nearly as long as the perisperm. *Cotyledons* round, cordate. *Radicle* sub-cylindric. I.

Obs. The want of the nuciform, bony, exterior integument of the seed in Gærtner's O. *trifoliatum*, ii. 129, induces me to think his cannot be the same, yet I know of no other to compare his with. 695

The root of this plant is employed for the cure of various disorders by the Telinga physicians. *First*, in substance, inwardly, as a febrifuge. *Secondly*, in the same manner, after the bite of poisonous animals. The juice is also expressed, and dropt into the eye, for the same purpose. And *thirdly*, it is administered, in substance, to promote delivery in tedious cases.

HUNTERIA. R.

Calyx five-parted. *Corol* infundibuliform. *Germ* two-lobed; *lobes* one-celled, two-seeded; *attachment* of the ovula sub-inferior. *Berries* two, pedicelled, one-celled, one or two-seeded.

1. H. *corymbosa. R.*

A tree, a native of Prince of Wales' Island, where it blossoms in July; in Bengal, in May; but in the latter place it has not ripened its seed.

Leaves opposite, short-petioled, oblong and lanceolate, obtuse, pointed, entire, smooth on both sides, from three to four inches long, and one or two broad. *Stipules* none, but a swelling on the inside of the base of the petiole. *Corymbs* terminal, decussate. *Flowers* numerous, small, white. *Calyx* one-leaved, five-parted, permanent, segments ovate. *Corol* one-petioled, funnel-shaped. *Tube* two or three times longer than the calyx, gibbous at the base, and swelled a little at the mouth. *Border* contorted, five-parted, divisions obliquely ovate-oblong, in the bud spirally imbricated. *Nectary* a fleshy ring round the base of the germ. *Filaments* five, very short. *Anthers* ovate, lodged in the swelled part of the tube, just within its mouth. I. *Germ* superior, ovate, two-lobed, two-celled, with two ovula in each, attached with their base 696 to the bottom of the partition. *Style* nearly the length of the tube of the corol. *Stigma*

Page Carey Ed ovate, short, with a two-lobed apex. *Berries* two, perfectly distinct, singly somewhat of a roundish ovate shape, short-pedicelled, size of a cherry, pulpy, when ripe orange-coloured, one-celled. *Seeds* two in each berry.

Obs. The whole of the generic character of this plant, agrees so well with that of *Carissa*, as it stands in the various editions of the *Genera Plantarum* that I have seen, (Jussieu's excepted) as to leave no doubt with those, who still may think two berries are the produce of one flower in that genus, that this ought to be considered a species thereof. But in all the Indian species of *Carissa*,* that I have yet met with, the pericarpium is uniformly single. As therefore this plant cannot be placed in the same family, I think it better to continue the former *generic* name *(Carissa,)* to the well known thorny plants described under that genus, for I have not yet met with any of the unarmed species, consequently cannot say what their pericarps may be. I consider this to be a well defined, perfectly distinct genus, and have named in after Dr. William Hunter of the Bengal Medical Establishment, an eminent Botanist, and author of various papers in the *Asiatic Researches*, of the *History of Pegu*, &c. He was the first discoverer of this very plant.

WEBERA. Schreb. gen. N. 1733.

Calyx five-parted. *Corol* funnel-shaped. *Germ* inferior, two-celled; *cells* few, or many-seeded; *attachment* interior. *Berry* bilocular; *cells* few, or many-seeded. *Embryo* centripetal, and furnished with a perisperm.

I. 697 1. W. *corymbosa. Willd. spec.* i. 1224. *Gært. carp.* 3. 71. *t.* 102.

Shrubby. *Leaves* from lanceolar to oblong, glossy. *Corymbs* terminal. *Calyx* five-parted, and nearly as long as the tube of the corol. *Capsules* few-seeded.

Roudeletia *asiatica. Linn. suppl.* 244.

Cupi. *Rheed. Mal.* ii. 37. *t.* 23.

Beng. Kunkra.

A pretty large, erect, unarmed, ramous shrub, common on most parts of the Coromandel coast.

Leaves opposite, petioled, broad-lanceolar, margins reflexed, smooth, deep shining green, with hairy glands in the axills of the large veins; six or seven inches long, and about two and a half broad. *Stipules* interfoliaceous, as in the other species. *Corymbs* terminal, large, divided by three. *Flowers* small, very numerous, white, faintly fragrant. *Calyx*, *corol*, and *stamens* as in the genus. *Germ* turbinate, two-celled, with from six to nine *ovula* in each, attached to the thickened centre of the partition. *Berry* the size of a large pea, when ripe smooth, shining black, two-celled. *Seeds* from four to eight in each cell. *Embryo* furnished with a perisperm, and centripetal radicle.

The extremities of the young shoots are often found covered with a white resinous matter. A substance of the same nature and appearance is to be found on the germs of most of the species of *Gardenia* known to me.

2. W. *macrophylla. R.*

Shrubby. *Leaves* broad-lanceolar. *Panicle* terminal. *Corols* with a long slender tube. *Berries* many-seeded.

A shrubby species, found by Mr. W. Roxburgh, indigenous on Prince of Wales' Island.

Young shoots somewhat villous. *Leaves* opposite, short-petioled, broad-lanceolar, entire, acuminate; from six to eighteen inches long, and from four to five broad. *Stipules* angu-
I. lar, &c. as in the *Rubiacea* of *Jussieu*. *Panicles* terminal, very large, brachiate, villous.
698 *Bractes* subulate, villous. *Flowers* large, white. *Calyx* divided into five, short, acute, villous segments. *Corol*; *tube* cylindric, long, slender and villous; *segments* of the border five, obliquely linear-lanceolate, shorter than the tube. *Filaments* short, rising above the mouth of the tube. *Anthers* filiform, nearly as long as the segments of the corol. *Germ* oval, two-celled, with many *ovula* in each, attached to an elevated receptacle on the centre of the partition. *Style* longer than the tube of the corol, villous. *Stigma* clavate. *Berry* the size of a pea, two-celled. *Seeds* many in each cell, from six to twelve, angular, &c. as in W. *corymbosa*, *Gært. carp.* 3. *t.* 192.

3. W. *scandens. R.*

Shrubby, scandent, glossy. *Leaves* oblong, cymes axillary. *Stigma* of two oval plates.

Gujer-kota, the vernacular name in Silhet, where it is indigenous. It flowers in April.

Stem and *branches* ligneous, scandent; *young shoots* polished, as is every tender part of the plant. *Leaves* opposite, short-petioled, long, entire, acuminate, glossy, about six inches long, and from two to three broad. *Stipules* as in the rest of the *Rubiacea*. *Cymes* axillary, and in the forks of the branchlets, solitary, divisions generally bi-ternate. *Flowers* large, infundibuliform, fragrant, when they first open white, but like the *Gardenias* become yellow by the second day. *Calyx* sub-campanulate, five-toothed. *Corol* with a long, slender tube, segments of the border five, obliquely oblong. *Anthers* linear, sessile on the mouth of the tube. *Germ* inferior, oval, two-celled, with many ovula in each, attached to an elevated receptacle on the centre of the partition. *Style* the length of the tube of the corol. *Stigma* of two, thin, oval lamina.

4. W. *oppositifolia. R.*

I. 699 Shrubby. *Leaves* lanceolar-oblong, firm and glossy. *Panicles* opposite to a leaf, composed of a few rigid, jointed, sub-recurved spikes. *Corols* with a short, woolly-mouthed tube. *Stigma* clavate, entire.

* To which, with the celebrated Jussieu I would join *Arduina.*

A native of Chittagong, where it blossoms in April.

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5. W. *odorata. R.*

Shrubby. *Leaves* lanceolar, polished, acuminate. *Corymbs* terminal. *Calyx* five-toothed.

Patugrooja, the vernacular name in Silhet, where it is indigenous, and grows to the size of a large shrub, or small tree. Flowering time the hot season, when the air is perfumed with the fragrance of its blossoms.

Leaves opposite, short-petioled, lanceolar, acuminate, entire, polished, from four to eight inches long, by from one to two broad. *Stipules* triangular, &c. as in the order. *Corymbs* terminal, trichotomous; ramifications villous. *Flowers* numerous, middle-sized, white, and very fragrant. *Bractes* opposite, sub-lanceolate, villous. *Calyx* poculiform, mouth five-toothed. *Corol* with the tube twice the length of the calyx; *border* of five, spreading, linear-falcate segments, which are longer than the tube. *Filaments* five, very short. *Anthers* subulate, nearly as long the segments of the border of the corol, over which they spread. *Germ* inferior, short, turbinate, two-celled, with three or four ovula in each, attached to the thickened middle of the partition. *Style* and *stigma* together longer than the corol, of a clavate-subulate shape.

ALYXIA. Banks.

Calyx five-toothed. *Corol* hypocrateriform. *Germ* two-lobed; *lobes* one-celled, few seeded; *attachment* interior. *Berries* two, pedicelled, one-seeded. *Embryo* erect, with echinate, lobed perisperm.

1. A. *stellata. R.*

Shrubby, often twining. *Leaves* tern, and quatern, oblong-lanceolate, polished. *Corymbs* terminal, simple, recurved.

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Gynopogon *stellatum. Forst. Prod. n.* 47. *Willd. spec.* i. 1221?

Pulassarium. *Rumph. Amb.* v. *p.* 32. *t.* 20.

A native of Amboyna, and from thence brought to the Botanic garden at Calcutta in 1798, where it thrives well, blossoms about the close of the rains in September, and ripens its fruit in the cool season.

Trunk scarcely any, but many, long, twining, straggling, or scandent branches as they meet with support. *Bark* of the ligneous parts ash-coloured, of the young shoots smooth, deep green. Every part abounds in a milky juice. *Leaves* tern, or quatern, short-petioled, oblong, or oblong-lanceolate, entire, of a deep shining green on both sides; with very slender, diverging, parallel veins; length from three to six inches. *Stipules*, a small scale between the petioles. *Flowers* many, small, pure white, collected in small, for the most part, terminal, cymose fascicles. *Bractes* short, cordate, rigid. *Calyx* deeply five-parted. *Corol; tube* swelled at the base, and a little below the mouth where the stamens are lodged, divisions of the border nearly round, in the bud imbricated. *Filaments* short. *Anthers* sagittate, just within the mouth of the tube. *Germ* two-lobed, and with care separable without violence, each lobe one-celled, and containing three or four ovula, attached to the corol. *Stigma* slightly two-lobed. *Berries* two, when both prove fertile, which is rarely the case, short-pedicelled, oval, size of a small cherry, smooth, with a groove on the inside from the blunt-pointed apex to the base, when ripe yellowish. *Pulp* in very small quantity; one-celled. I have frequently found proliferous berries, that is a second, on a short pedicel, growing from the apex of the first, as in the genus *Anosa*. *Seed* conform to the berry. *Integuments* single, thin but hard and elastic, approaching to nuciform; from the middle of the inside a vertical lamina projects one-third into the seed, then divides and proceeds in opposite directions, like the receptacles in *Chironia* (see *Gært. sem.* ii. *t.* 114.) to these the perisperm is attached. *Perisperm* conform to the seed, in the centre a thin portion thereof forms an entire sac, or cavity for the embryo, the rest is divided into innumerable, diverging, fleshy, cuneiform lobes; colour greenish, becoming white, texture fleshy. *Embryo* erect, straight, nearly as the perisperm. *Cotyledons* lanceolar. *Radicle* sub-cylindric, inferior.

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Obs. I am inclined to think that this may be *Forster's Gynopogon stellatum*, or another species of the same genus; (now *Alyxia*; see *Brown's Prodromus, Nov. Holl.* i. 469.) and I conclude he had not an opportunity of making himself acquainted with the carpology of the genus. Until I met with the fruit I considered it a *Rauwolfia*; but am now satisfied it cannot belong to that family. To what natural order? *Apocyneæ?*

OPHIORRHIZA. Schreb. gen. N. 273.

Calyx five-toothed. *Corol* funnel-shaped. *Germ* inferior, two-celled; *cells* many-seeded; *attachment* to a sub-inferior, free, clavate receptacle. *Stigma* bifid. *Capsule* two-lobed, two-celled. *Seeds* numerous, angular.

1. O. *Mungos. Willd.* i. 826.

Leaves opposite, elliptic, smooth. *Corymbs* terminal.

Radix Mungo. *Kæmpf. Amoen.* 573 and 577.

Leaves opposite, petioled, oblong, entire, pointed, in texture remarkably thin, length from four to six inches. *Petioles* short, villous. *Stipules*, a slight connecting membrane. *Corymbs* terminal, many flowered. *Calyx* superior, one-leaved, five-toothed, permanent. *Corol* one-petalled, funnel-shaped; *tube* short; border five-parted; divisions oblong, hairy on the inside, pointed. *Nectary* a thick, two-lipped, fleshy body crowning the germ between the base of the stamens and style. *Filaments* five, very short, inserted on the base of the tube. *Anthers* linear, erect, nearly hid in the tube of the corol. *Germ* beneath, turbinate. *Style* as long as

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Page Carey Ed. the stamens. *Stigma* two-lobed. *Capsule* obverse reniform, totally compressed, (two-lobed); on the outside five ribs run down from the divisions of the calyx, internally divided into two cells by a transverse partition, opening between the remains of the two fleshy nectarial lips. *Receptacle* sub-cylindric, free, affixed to the partition near its base. *Seeds* very numerous, angular.

Obs. From my own knowledge, I can say nothing of the virtues, that have been by various authors ascribed to the root of this plant. Indeed I am rather inclined to look upon the whole to be a fiction.

2. O. *villosa. R.*

Suffructicose, erect, villous. *Leaves* from ovate-oblong to lanceolar. *Corymbs* terminal, long-peduncled, villous.

A native of shaded, moist places amongst the hills of Chittagong; where it blossoms in May, and the seed ripens in three or four months.

Stems a few inches high, simple, sub-ligneous, while young hairy. *Leaves* opposite, short-petioled, oblong, entire, veins many, large, parallel, and hairy; from three to four inches long, and one or two broad. *Stipules* ensiform, villous. *Corymbs* terminal, solitary, rather long-peduncled, sub-globular, rough, with ferruginous pubescence, composed of a few recurved, short, villous branches, with the numerous, white, sub-sessile flowers on the upper, or convex side thereof. *Calyx* hairy, five-toothed. *Corol* funnel-shaped. *Tube* the length of the five segments, its mouth shut with hairs. *Filaments* five, inserted on the bottom of the tube of the corol. *Anthers* linear, erect. *Nectary* a fleshy bilabiate body on the top of the germ embracing the base of the style, as in O. *Mungos*. *Germ* turbinate, inferior, two-celled, with
I. numerous ovula in each, attached to two large, free receptacles which are attached to the base
703 of the partition. *Style* the length of the tube of the corol. *Stigma* large, two-lobed, villous. *Capsule* two-lobed, transverse, breadth twice the height, two-celled, opening round the apex. *Seeds*, &c. as in O. *Mungos, Gært. Carp.* i. 264. *t.* 55.

GARDENIA. Schreb. gen. N. 416.

Calyx with the divisions uncertain. *Corol* funnel-shaped. *Germ* inferior, one-celled, with numerous ovula, attached to two or more parietal receptacles. *Berry* one-celled, many-seeded. *Embryo* furnished with a perisperm, directions various.

With Jussieu, Lamarck, Gærtner and others, I have at last separated the *Gardenias* with a one-celled seed vessel and parietal receptacles from those which are two-celled, with the receptacles attached to the partition. To those still called *Gardenia* belong the following unarmed species, viz. G. *florida, calyculata, costata, latifolia, arborea, lucida, gummifera, tetrasperma, montana*, and the two armed species, *turgida*, and *campanulata*. And to the latter (*Posoqueria*) belong *uliginosa, dumetorum, nutans, longispina, fragrans, fasticulata*, and *longiflora*, all of which are armed.

SECT. I. *Unarmed.*

1. G. *florida. Willd. spec.* i. 1225.

Shrubby, unarmed. *Leaves* oval, acute at both ends. *Berries* long, turbinate, with as many sharp ridges as there are divisions in the calyx.

Sans. Gundhuraja.

Beng. Gundhuraj.

Catsjopiri. *Rumph. Amb.* vii. 26. *t.* 14. *f.* 2.

A large, very ramous shrub, found in gardens about Calcutta, and originally from China.

Thunberg's description of it is the best I have seen, I can only add that the flowers are
I. axillary for the most part, and that in the calyx I have always found a small inflected tooth-
704 like process at the bottom of each fissure, which exists also in that of the ripe berry. The seeds nestle in a firm, deep orange-coloured pulp, which is a substance employed for dyeing in some parts of India.

To distinguish it from *Gardenia sulcata, Gært. carp.* iii. *p.* 78. *tab.* 194, I will add the following account of the fruit of this species. *Germ* turbinate, from five to six, acute-angled; at the base from three to five-celled; above one-celled, with from three to five parietal receptacles, to which the numerous ovula are attached. *Berry* oblong, orange-coloured, smooth, the size of a pigeon's egg, down the sides run six equi-distant ribs, a continuation of the permanent, ensiform segments of the calyx, one-celled. *Receptacles* generally four, projecting from the lining of the cell to about one-fourth of its diameter, when they divide into two or more portions. *Seeds* numerous, nidulant in orange pulp, roundish, a little compressed, rugose; mode of attachment on the ripe fruit obscure. *Perisperm* conform to the seed, pale. *Embryo* straight, nearly as long as the perisperm. *Cotyledons* two, cordate. *Radicle* straight, pointing to, very near to the umbilicus.

2. G. *calyculata. R.*

Arboreous. *Leaves* petioled, ovate, acuminate, smooth. *Flowers* terminal, solitary, sessile, germ involucred. *Calycine segments* ensiform. *Anthers* within the swelling tube of the five-cleft corol.

Native place uncertain; some thirty years ago, it was brought from Hydrabad to Lord Pigot at Madras, who planted it in his garden there, where it was pointed out to me by Lady Clive in 1798. The flowers are large, white, and like most of the genus, fragrant.

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3. G. *costata. R.*

Arboreous, unarmed. *Leaves* cuneiform-oblong, smooth, ribbed. *Calyx* five-angled. *Flowers* hypocrateriform. *Berry* drupaceous, oval, five-ribbed, one-celled, shell two-valved.

A native of the mountainous parts of India. From those of Chittagong, it has been introduced into the Botanic garden at Calcutta ; where, in ten or twelve years it has arrived to the size of a small elegant tree. It blossoms in April, and the seeds take nearly one year to ripen.

Trunk straight, in twelve years old trees eighteen inches circumference. The *branches* expand but little, the *bark* of the ligneous parts is smooth and ash-coloured, that of the young shoots round, and somewhat harsh, with short, adpressed hairs ; whole height from ten to twenty feet. *Leaves* opposite, short-petioled, oblong, and cuneiform-oblong, smooth, when young resinous, entire, pointed ; veins numerous, large, and parallel ; length from six to twelve inches, and the breadth from three to five. *Stipules* interfoliaceous, supporting the leaves. *Flowers* terminal, or nearly so, very large, the tube being above three inches long, and the border above four in diameter ; when they first expand at day-break, they are white, but in the course of the day change to a pretty deep yellow, powerfully fragrant. *Calyx* cylindric ; *mouth* irregularly divided into five lobes ; outside resinous, and strongly marked with five, very prominent angles, caducous. (In my *lucida*, which this resembles most, it is permanent, smooth on the outside, and deeply divided into five uniform segments.) *Corol ; tube* cylindric ; *border* of five obliquely ovate segments. *Anthers* five, sessile, completely within the mouth of the tube, of two filiform lobes. *Germ* clavate, five-angled, and one-celled, with numerous ovula attached to two opposite receptacles, rising from the sides of the cell, as in Gærtner's figure of *Chironia baccifera, carp.* 2. *t.* 114. *Style* the length of the tube. *Stigma* rather above the tube, large, and consisting of two variously grooved lobes. *Berry* drupaceous, oblong, ventricose, smooth, yellow ; five strong vertical ribs run its whole length. *Pulp* yellow, soft and rather fœtid, one-celled. *Shell* thick, hard, and two-valved. *Seeds* numerous, small, shape very irregular, but always much flattened, nidulant in dark-coloured, soft pulp. It is only in the germ that their insertion can be clearly traced. *Integument* hard and two-valved. *Perisperm* soft. *Embryo* straight, nearly as long as the perisperm. *Cotyledons* ovate. *Radicle* as long as the cotyledons, and pointing directly to the umbilicus which is generally the most pointed end of the seed.

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4. G. *latifolia. Willd. spec.* i. 1226.

Arboreous, unarmed. *Leaves* opposite, or tern, sub-sessile, ovate. *Flowers* terminal, three-fold, sessile, from eight to nine-cleft. *Berry* drupaceous, round, even, one-celled, five-valved.

Hind. Papara.

Gardenia *enneandra. König's Mss.*

Telinga. Caringua.

Is a native of barren rocky hills both in the Circars, and Carnatic, like the other species it flowers about the beginning of the hot season, and the seeds take nearly one year to ripen.

By slow growth it becomes a small tree, with sub-erect branches, covered with smooth, ash-coloured *bark*. *Leaves* either opposite, or three-fold, in a good soil always three-fold, nearly sessile, inserted into the stipulary ring, obovate, entire, of a deep shining green on the upper side, paler on the lower; veins many and large, running parallel ; in their axills are hollow glands, with hairy margins ; from six to twelve inches long. *Stipules* annular within the leaves, splitting irregularly when old. *Flowers* one, two, three, or four, at the extremities of the branchlets, very large, very fragrant ; when they first open in the morning white, gradually growing yellow before night. *Peduncles* short, one-flowered. *Calyx* small, irregularly divided. *Corol ; tube* long, cylindric, smooth. *Border* large, spreading, from seven to eleven cleft, divisions obliquely oblong, the length of the tube. *Filaments* none. *Anthers* corresponding with the number of segments in the border of the corol, linear, pointed at both ends, half immersed in the tube, the other half above its mouth. *Germ* oblong, one-celled, containing numerous ovula, attached to five parietal receptacles. *Berry* the size of a pullet's egg, nearly round, crowned, with a small part only of the tube of the calyx, which makes me suspect *Gærtner's* G. *latifolia, vol.* iii. *p.* 78, must belong to a different species. That my plant is the original *latifolia* I know well, as I was with König when he first discovered it. Colour at all times a cineritious greenish yellow, a little scabrous, one-celled, and the internal, nuciform portion five-valved. *Seeds* very numerous, attached to five parietal receptacles.

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Obs. This species is very deserving of notice. Its large, white, young, glossy, green leaves, independent of the size, beauty and fragrance of the flowers, render it very ornamental.

5. G. *lucida. R.*

Sub-arboreous, unarmed, erect, gems resinous. *Leaves* oblong, smooth, hard, and lucid, with simple parallel veins. *Divisions* of the calyx subulate. *Tube* of the corol cylindric, three times the length of the calyx, border five-parted. *Berries* drupaceous, with a two-valved cell.

A native of Chittagong and various other parts of India. It is in flower and fruit the greater part of the year.

Trunk short, and straight. *Branches* numerous, opposite, decussate, ascending, covered with smooth, ash-coloured bark ; *young shoots* round, smooth, and generally incrusted with a little yellow resin, a bright yellow drop of which is often found on the gems. *Leaves* opposite, short-petioled, oblong, smooth ; *margins* interior and waved ; rather obtuse-pointed, hard to the feel, both surfaces polished ; *veins* numerous, parallel, and simple ; about six inches long, and about three broad. *Stipules* annular, within the leaves ; *mouth* variously divided into unequal, obtuse segments. *Peduncles* terminal, and above the axills, solitary, round, clavate, smooth,

I. 708 from half an inch to an inch long, supporting a simple beautiful, large, pure white, fragrant flower. *Calyx* five-cleft. *Segments* ensiform, with the margins incurved, so as become subulate; permanent. *Corol; tube* cylindric, smooth, from one to two inches long, which is more than twice the length of the calyx. *Border* five-parted; *divisions* obliquely obovate-oblong, about the length of the tube. *Filaments* none. *Anthers* five, very long, slender and acute, half hid in the tube of the corol, and affixed by their backs to its mouth. *Germ* oblong, even, one-celled, containing numerous *ovula* attached to two parietal receptacles. *Style* length of the tube of the corol. *Stigma* clavate, exsert. *Berry* drupaceous oblong, size of a pigeon's egg, smooth, crowned with the permanent calyx, one-celled, its inner lamina of a bony hardness, turning into the cell on opposite sides, but soon separated into two receptacles each. *Seeds* numerous, attached to the just mentioned receptacles. *Perisperm* conform to the seed. *Embryo* with two cordate cotyledons, and a cylindric radicle pointing to the umbilicus.

Obs. The total want of pubescence, structure of the stipules, length of the calyx, and sharpness of its divisions, distinguish this from G. *gummifera*, which it most resembles.

6. G. *arborea. R.*

Arboreous, unarmed. *Leaves* ovate-oblong. *Flowers* terminal, often three-fold, subsessile; *tube* filiform; *border* five-parted. *Berry* drupaceous, even; *shell* four or five-valved.

Tam. Karinga marum.

Teling. Garga.

A native of the Circar mountains. Its leaves are deciduous during the cold season, and it continues naked till the hot season is pretty far advanced. Flowering time the beginning of the hot season while the tree is naked of leaves.

From the buds and wounds made in the bark there exudes a very beautiful yellow resin,

I. like that from *Gardenia gummifera.*

709 The size, number, fragrance, mutability and beauty of the flowers of this species, renders it more deserving of a place in our gardens than any species I know; I may even say, than G. *florida.*

The natives eat the ripe fruit.

7. G. *gummifera. Linn. Suppl.* 164.

Shrubby, with resinous gems. *Leaves* oblong, obtuse-pointed. *Divisions* of the *calyx* ovate, acute, and very short. *Tube* of the corol as long as the divisions of its border.

Native of Coromandel.

In a specimen in the Banksian herbarium, the divisions of the calyx are long, slender, and acute.

8. G. *tetrasperma. R.*

Shrubby. *Leaves* obovate-cuneate, smooth. *Flowers* axillary, solitary, short-peduncled, pentandrous. *Calycine segments* subulate. *Berry* round, four-seeded.

Found by Colonel Hardwicke on the mountains near Shreenugur. See *Asiatic Researches*, vi. 354.

SECT. II. *Armed.*

9. G. *montana. R.*

Arboreous. *Leaves* oblong-ventricose, downy underneath, terminal, short-peduncled. *Stamens* within the belly of the tube. *Berry* drupaceous, sub-rotund; *shell* from five to six-valved.

Telinga. Tella kakisha.

A small, ramous tree; armed with strong, short, acute thorns; a native of the Circar mountains. *Leaves* deciduous in December. It flowers about the beginning of the hot season, viz. in March and April, soon after which the leaves appear. *Bark* white, soft and spongy.

Thorns above the axills, opposite, spreading, short, but sharp; sometimes they are want-

I. ing. *Leaves* opposite on the young shoots, fascicled on the older, nearly sessile, oblong,

710 obtuse, entire, with the margins revolute, above shining and smooth, a little downy underneath, three inches long, by two broad. *Stipules* annular, within the leaves, membranous. *Flowers* three, four, five, or six, from little buds about the extremities of the naked branchlets, pretty large, very fragrant, when first open white, but soon becoming more or less yellow. *Peduncles* short, one-flowered. *Calyx* small, somewhat five-toothed, permanent. *Corol; tube* short, somewhat gibbous; *throat* smooth. *Border* from five to seven-cleft; *divisions* wedge-shaped, emarginate. *Filaments* none. *Anthers* in number equal to the segments of the border of the flowers, linear, entirely within the tube. *Nectary* a monifiform, fleshy ring surrounding the insertion of the style. The *stigma* just appears within the tube. *Berry* the size of a pullet's egg, scabrous, ash-coloured and yellow mixed; an exterior, pulpy cortex covers a hard bony shell which immediately encloses the seeds with their pulpy nidus, it is one-celled, five or six-valved, and the incurved edges of the valves form the parietal receptacles for the seeds.

10. G. *campanulata. R.*

Shrubby, armed. *Leaves* lanceolar, smooth. *Flowers* in terminal and lateral fascicles. *Calyx* five-toothed. *Corol* campanulate; *border* five-cleft. *Berry* round.

A native of the forests of Chittagong. Flowering time the month of March; seed ripe in November.

Trunk straight, but short, soon dividing and subdividing into numerous, stiff, erect, and spreading branches. *Bark* of the old parts brownish green, and pretty smooth; that

of the tender parts lighter coloured; height of the shrub in five years, from five to ten feet. *Thorns* single, short, strong, and sharp, they generally terminate the little, lateral, opposite branchlets. *Leaves* opposite, short-petioled, broad-lanceolate, tapering most toward the base, entire, and smooth on both sides, from two to five inches long, and from one to two broad. *Stipules* triangular, acute. *Flowers* small, of a pale yellowish white, short-peduncled, crowded on the extremities of short, rigid, lateral, spinous branchlets. *Calyx* cylindric, five-toothed. *Corol* with a five-sided, campanulate tube, and a border of five obliquely-ovate segments. *Anthers* five, sessile in the bell of the corol. *Germ* inferior, one-celled, containing numerous ovula attached to generally five, parietal receptacles. *Style* short. *Stigma* somewhat five-grooved, and situated deep in the tube. *Berry* round-ovate, the size of a golden pippin, smooth, depressed, and slightly five-furrowed at the apex and base; one-celled; the exterior tunic thick, fleshy, yellowish, with slender, hard, longitudinal fibres interspersed, the inner tunic thin and firm, but not bony, the edges of which turn in five portions, forming five parietal receptacles. *Seeds* minute, nidulant in a little yellow pulp. *Perisperm* conform to the seed, pale. *Embryo* straight. *Cotyledons* round. *Radicle* cylindric, pointing to the umbilicus. Page Carey Ed. I. 711

Obs. The fruit is used by the natives as a *cathartic* and *anthelmintic*, and also to wash out stains in silk.

11. G. *turgida. R.*

Arboreous, with swelled mealy bark, branches brachiate. *Thorns* opposite and terminal. *Leaves* obovate, smooth. *Flowers* lateral, sub-solitary, calyx five-toothed, apices of the anthers scarcely peeping from the tube of the smooth corol.

A native of Bhotan, and introduced by Dr. Carey into the Botanic garden at Calcutta, where it blossoms during the months of March and April, the season when most other species of this genus are in flower, but after being twelve years in the garden it has not once ripened a single fruit.

Trunk straight. *Bark* very thick and spongy, appearing as if swollen and somewhat mealy. *Branches* brachiate, drooping short, and covered with bark like that of the trunk. *Spines* opposite, above the axills, and, when not terminal, in form of a small leaf-bearing branchlet, shorter than the leaves. *Leaves* opposite, sub-sessile, obovate, entire, smooth on both sides, from one to four inches long, and from one to three broad. *Stipules* interfoliaceous acute. *Flowers* lateral, generally single, sub-sessile, large, white, and fragrant. *Calyx* short, cylindric, smooth, mouth slightly five-toothed. *Corol; tube* many times longer than the calyx, somewhat gibbous. *Border* of five, spreading, and finally revolute, obliquely-oblong, obtuse segments. *Stamina* no filaments. *Anthers* filiform, with their apices only peeping from the mouth of the tube. *Germ* turbinate, one-celled, ovula numerous, attached to four or five parietal receptacles. *Style* short. *Stigma* clavate, five-grooved, rather longer than the anthers. I. 712

Obs. The swollen, even bark of this species and its straight trunk even up through the branches, render it readily known and easily distinguished from all our other Indian *Gardenias.*

POSOQUERIA. Aubl. Juss. Lamarck, and Gært. also Ceriscus of Gært.

Calyx five or six-cleft. *Corol* tubular, border from five to six-parted. *Germ* inferior, two-celled; *ovula* numerous, attached to a free receptacle from the centre of the partition. *Berry* two-celled. *Seeds* numerous, nidulant. *Embryo* furnished with a perisperm, direction various.

1. P. *uliginosa. R.*

Arboreous, armed, branches straight, four-sided; *branchlets* decussate, horizontal, bearing the thorns and flowers at their extremities. *Berry* oval, drupaceous, even.

Gardenia *uliginosa. Willd. spec.* i. 1228.

Beng. Peeralo.

Tam. Wagatta.

Telinga. Nella-kakisha.

A rigid ramous, small tree, armed with numerous, strong thorns. A native of various parts of India, delighting in moist places, such as the banks of rivers, low lands, &c. Flowering time the beginning of the hot season, and in some measure all the year. The seeds ripen in the cool season. I. 713

Trunk short, covered with a dark, rust-coloured, scabrous *bark. Branches,* some stiffly erect, very rigid, four-cornered, thick set with short, round, diverging, decussated branchlets; others spreading. *Thorns* one, two, three, or four, at the extremities of the short, round branchlets just mentioned. *Leaves* opposite, on the young shoots, fascicled at the extremities of the branchlets, short-petioled, oblong, smooth, shining, entire, from two to three inches long, by one and a half broad. *Stipules* within the leaves as in the rest of the genus. *Flowers* one, two, or three upon their proper short peduncles, at the extremites of the branchlets, large, white and fragrant. *Calyx* tubular, obtusely five-toothed, permanent. *Corol,* mouth of the tube shut up with much white hair. *Border* flat, from five to eight-cleft; divisions orbicular. *Nectary* a fleshy, angular ring surrounding the base of the style. *Germ* inferior, two-celled, each containing numerous ovula, attached to a crescent-shaped receptacle in each cell, vertically united to the middle of the partition. *Berry* two-celled, size and shape of a pullet's egg, bark ash-coloured, or olive; pulp in large quantity, hard and dry. *Seeds* numerous, oval, flattened, nidulant. *Embryo* furnished with a perisperm, its direction various.

The flowers of this species render it deserving of a conspicuous place in the flower garden. The uncommon appearance of the plant is also in its favour.

2. P. *dumetorum. Willd.* i. 1229.

Page Carey Ed. Sub-arboreous, armed. *Leaves* obovate. *Flowers* lateral, and terminal, solitary; *tube* short, border five-parted. *Berry* drupaceous, spherical.

Gardenia *dumetorum. Willd.* i. 1229.

G. *spinosa. Suppl. Plant. p.* 164.

I. *Telinga.* Manga.

714 This is one of the most common, thorny, ramous shrubs, or, in a good soil, small trees, on the coast; there is scarcely an uncultivated spot where it is not to be found. Flowering time the beginning of the wet season.

Dr. König's description of this shrub, published in the *Supplementum Plantarum* of the younger Linnæus is good and full.

Germ two-celled, each containing many ovula attached to a crescent-shaped receptacle in each cell, which is vertically attached to the middle of the partition. *Berry* round, smooth, when ripe yellow, and much like a small crab apple both in size and appearance. *Pulp* in large quantity, of a firm, fleshy texture, two-celled. *Seeds* numerous, oval and oblong, attached as in the germ, and nestling in a quantity of gelatinous pulp. *Perisperm* conform to the seed. *Embryo* more than half the length of the seed, straight. *Cotyledons* roundish. *Radicle* cylindric, length of the cotyledons, *vaga.*

It is employed for fences, and fire-wood. The flowers like all the rest of this genus are highly fragrant, but in this species few in number.

The fruit when ripe, looks like a small yellow apple; if bruised and thrown into ponds where there are fish, they are soon intoxicated, and seen floating. If this is done during the hot season, it is said, the fish generally die, but if during the wet or cold season they recover.

Fishermen sometimes follow this mode to enable them to take the fish with more ease. They are not deemed less wholesome from the effects of the fruit. *Cocculis Indicus* does not grow in those parts, nor is it known or used there for this purpose.

3. P. *nutans. R.*

Shrubby, armed, branchlets drooping. *Leaves* narrow-obovate-oblong. *Flowers* solitary.

I. *Berries* round, crowned with the entire calyx.

715 *Ciriscus malabaricus. Gært. sem.* i. *t.* 28, is with respect to shape and size a very good representation of the berry, but to render it exact, the calycine segments, and the receptacles of the seeds must be added. The figures are too small for *dumetorum* growing in exactly the same spot, and with the same management. In the Botanic garden at Calcutta, in twelve years, this is a tall slender shrub with very slender drooping branches, and a trunk not thicker than a man's wrist, whereas *dumetorum* of the same age has grown to be a stout, rigid, small tree, with a trunk two inches and a half in circumference, at four feet above the ground.

Trunk straight, from three to four feet high. *Branches* numerous, with the extreme divisions long, slender, and drooping; tender shoots a little hairy. *Spines* axillary, opposite, horizontal, straight, slender, but hard, stiff, and sharp. *Leaves* on the young shoots opposite, on the old ones fascicled, short-petioled, from cuneiform-oblong to round, from one to two inches long, by about one broad. *Stipules* triangular, acute, &c. as in the order. *Flowers* solitary from the old axills under the spines, with or without leaves, short-peduncled, middle-sized, white and fragrant. *Calyx* with a short, rather hairy, cylindric tube, and five-parted border, all permanent. *Corol*, outside sericeous. *Tube* very little longer than the calyx, swelled near the base, and there shut with a dense circle or valve of white hairs, pointing upwards. *Border* of five, obovate, spreading segments, which are imbricated in the bud. *Filaments*, scarcely any. *Anthers* filiform, without the tube. *Germ* turbinate, two-celled, with many ovula in each, attached to two peltate receptacles arising from the centre of the partition. *Style* rather longer than the tube of the corol, swelled near the middle. *Stigma* large, roundish, clammy, apex two-lobed. *Berry* the size of a nutmeg, nearly round, somewhat rugose, pulpy, crowned with the entire calyx, two-celled. *Seeds* nu-

I. merous, small, oval, flattened. *Perisperm* and *embryo* as in the other species.

716 4. P. *longispina. R.*

Arboreous, armed, spines opposite, and alternate, horizontal. *Leaves* obovate-cuneate, smooth. *Flowers* solitary, terminal, and axillary. *Calyx* smooth, border permanent. *Fruit* obovate, smooth.

A native of the coast of Coromandel. Flowering time the hot and rainy season.

Trunk straight. *Branches* numerous, the smaller long, slender, spreading, and drooping, a habit which immediately distinguishes this species from König's *dumetorum*; its branches being short and rigidly erect. *Spines* opposite or alternate, decussate, horizontal, straight, strong and sharp; length from one to two inches. *Leaves* on the young shoots opposite, on the old ones in fascicles below the spines, all are short-petioled, obovate-cuneate, entire, smooth on both sides; size varying, from half an inch to three inches in length. *Stipules* (examine the very young shoots to find them) within the leaves, subulate, pointed. *Flowers* solitary, short-peduncled, generally from the extremities of the little, leaf-bearing branchlets below the spines, rarely axillary, pretty large, pure white, and fragrant. *Calyx* perfectly smooth. *Tube* cylindric; border of five, ovate-cordate, permanent segments. In *dumetorum* the tube only is permanent. *Corol* salver-shaped. *Tube* as long as the tube of the calyx, villous on the outside, within, a ring of projecting hairs shuts it up about the middle. *Border* of five, obliquely ovate, spreading divisions. *Filaments* none. *Anthers* five, linear, affixed over the fissures of the border of the corol, and entirely without its tube. *Style* thickened at the middle. *Stigma* erect, two-lobed. *Berry* obovate (in P. *dumetorum*

round,) size of a large nutmeg, smooth, two-celled. *Seeds* numerous, immersed in pulp. Page Carey Ed. I. 717

Obs. Thunberg's *Gardenia spinosa* is a plant I have not seen, if it be not König's *dumetorum* or this very species I have now described, consequently cannot say wherein they differ, but from *dumetorum*, which I know well, it differs very conspicuously in the structure, and disposition of the branches, in the shape of the fruit, and in the border of the calyx being permanent.

5. P. *fragrans. Kön. Mss.*

Shrubby, armed. *Leaves* long-obovate. *Flowers* numerous, collected in small, simple, terminal umbellets. *Berries* from eight to ten-seeded.

Gardenia *fragrans. Kön. Mss.*

Telinga. Pedally.

With P. *dumetorum* it is a common, rigid, shrubby species; it seems also to delight in a poor soil, and like it is armed with strong sharp thorns. Brought into a good soil these almost totally disappear. It flowers about the beginning of the rains in June and July.

Leaves opposite on the young shoots, fascicled on the old ones, short-petioled, oblong; on both sides are smooth and glossy hollow glands in the axills of the large nerves; border hairy; from two to three inches long, by one and a half broad. *Stipules* connecting the petioles, acute. *Umbellets* simple, small, terminal, or from small tuberosities on the branchlets, bearing many, small, white, fragrant flowers. *Peduncles* short. *Bractes*, a small, acute one at the base of each pedicel. *Calyx* five-toothed, toothlets acute. *Corol*, throat hairy. *Border* always five-cleft, divisions acute. *Stamens* and *pistillum* as in the genus. *Berry* the size of a small cherry, red, two-celled. *Seeds* from eight to twelve in both cells, kidney-shaped, orange-coloured.

Obs. I know of no use this tree is put to, except to make fences, for which it is well adapted, particularly when it is the produce of a poor barren soil, it is then well armed with strong thorns. The flowers like those of all the rest, are delightfully fragrant.

6. *P. fasciculata. R.* I. 718

Shrubby, spines axillary, patent. *Leaves* ovate-oblong, sub-sessile. *Fascicles* axillary, and in the forks of the branches. *Berries* two-celled.

A middling-sized, very ramous, well armed shrub, a native of Silhet, where it blossoms in March and April.

Branchlets smooth, opposite and dichotomous. *Spines* axillary, patent, straight, rather short. *Leaves* opposite, short-petioled, ovate-oblong, entire, pretty smooth, from one to three inches long. *Stipules* interfoliaceous, acuminate. *Flowers* collected into small, sub-sessile fascicles, in the forks of the dichotomous branchlets, or axillary, middling-sized, and like those of most of the other species, fragrant; when they first expand they are white, but gradually change to pale yellow by the second day. *Calyx* hairy, margin divided into five, subulate segments. *Corol* infundibuliform, border of five oblong segments. *Filaments* scarcely any. *Anthers* five, linear, one-third of their length within the tube of the corol. *Germ* inferior, two-celled, each containing many ovula attached to a receptacle rising from the centre of the partition. *Style* of the corol. *Stigma* clavate, unequally two-lobed.

7. P. *longiflora. R.*

Arboreous, armed with opposite, recurved spines. *Leaves* lanceolar-oblong, smooth. *Corymbs* terminal and axillary, few-flowered.

Compare with *Gardenia multiflora. Willd.* i. *p.* 1231.

A native of Chittagong, where it grows to be a pretty large tree. It flowers during the hot season, and the seeds ripen in July and August.

Branches and *branchlets* opposite, and smooth. *Spines* axillary, very strong, sharp, and considerably recurved. *Leaves* opposite, short-petioled, from broad-lanceolar to oblong, entire, smooth, from four to six inches long, by one and a half or two broad. *Stipules* as in the order. *Corymbs* terminal, and axillary, short, generally about eleven to thirteen-flowered, every part smooth. *Flowers* large, pale, or nearly white when they first expand, becoming yellow by the second day, fragrant. *Calyx* tubular, mouth cut into five, semilunar segments. *Corol; tube* long and slender; *border* of five, unequally lanceolate, spreading segments. *Filaments* none. *Anthers* five, linear, attached to the mouth of the tube of the corol. *Germ* inferior, two-celled, with many ovula in each, attached to their elevated fleshy receptacle, rising from the centre of the partition. *Berries* the size of common cherries, when ripe yellow, smooth, fleshy, two-celled. *Seeds* numerous, &c. &c. as in the genus. I. 719

8. P. *floribunda. R.*

Sub-arboreous, armed. *Leaves* opposite and fascicled, obovate, cuneate. *Flowers* in lateral fascicles; calyx longer than the tube of the corol, its segments lanceolate. *Berries* ovate-cordate, polished.

A large, rigid, ramous shrub, or, in a good soil, small tree, like *dumetorum* a native of the coast of Coromandel. Flowering time April and May, and the seeds ripen immediately after the rains.

Trunk in ten years old plants in the Botanic garden at Calcutta as thick as a man's leg, but short, soon dividing into numerous branches, and straight, stiff branchlets, in every direction. *Bark* ash coloured, on the oldest parts considerably cracked. *Spines* axillary, and rarely more than one to each pair of leaves; about an inch long, stiff, straight, rigid and sharp. *Leaves* on the tender shoots opposite, on the old flower-bearing twig fascicled, round [illegible]; the general form obovate, tapering a good deal to the base; obtuse, smooth, from one to two inches long, by one broad. *Stipules* as in the order. *Flowers* short-peduncled, generally from four to six produced from each of the small lateral, short, scaly

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spurs, (as they are called by gardeners,) of a middling size, and fragrant, when they first expand pure white, but soon becoming yellow. *Calyx* smooth; *tube* cylindric; *segments* of the border generally five, sub-lanceolate, acuminate, permanent. *Corol*, outside sericeous. *Tube* rather shorter than the calyx, shut about the middle with a valve of fine white hairs pointing up. *Border* of five, obovate segments. *Filaments* scarcely any. *Anthers* linear, spreading. *Germ* turbinate, two-celled, ovula numerous, attached to a far-projecting receptacle from the centre of each side of the partition. *Style* rather longer than the tube of the corol, swelled toward the middle. *Stigma* oblong, two-lobed. *Berries* broad, ovate-cordate, polished, size of a prune, crowned with the remaining tube of the calyx; two-celled. *Seeds* numerous, &c. &c. as in the other species.

II. 1

VINKA, Schreb. gen. N. 419.

Corol funnel-shaped. *Follicles* two, erect. *Seeds* naked. *Embryo* inverse, and furnished with a perisperm.

1. V. *rosea, Willd.* i. 1233.

Perennial, erect, ramous. *Flowers* in pairs, sessile. *Leaves* ovate-oblong, base of the petiole two-toothed.

Hind. Gool-fering.

Obs. Both the red and white varieties are common in gardens over India, and in flower great part of the year. I have never found it in its native state.

2. V. *parviflora, Willd.* i. 1234. *Retz. Obs.* ii. *N.* 33.

Annual. *Leaves* lanceolate; flowers in pairs. *Mouth* of the tube contracted, and shut with hairs.

Cupa-veela, *Rheed. Mal.* ix. *t.* 33.

Vinka pulsilla. *Linn. suppl.* 166.

A small, erect, annual, ramous plant; a native of open, fertile, cultivated lands. *Flowers* during the wet season.

II. 2

Stem erect, smooth, branchy, four-sided; *angles* acute, from six to twelve inches high. *Leaves* opposite, short-petioled, lanceolate, entire, smooth; about two inches and a half long, and three-fourths of an inch broad. *Stipules* subulate. *Flowers* axillary, in pairs, small, white, short-peduncled.—*Corol*, mouth of the tube contracted, and shut with hair.—*Nectarial* corpuscles as in the family.

NERIUM, Schreb. gen. N. 420.

Corol funnel-shaped; mouth of the tube variously crowned. *Germ* two-celled; cells many-seeded, attachment interior. *Follicles* two. *Seeds* many, comose. *Embryo* inverse, (sub-convolute, or expanded.)

1. N. *odorum, Willd.* i. 1235.

Leaves linear-lanceolate, tern. *Segments* of the calyx erect. *Nectaries* many-cleft, divisions filiform.

Sung. Karavira, vide *Asiat. Researches*, iv. 265.

Beng. Kur*u*bee, R*u*kt*a* Kur*u*bee (the red variety), Swet*a* Kur*u*bee (the white variety), Pudm*a* Kur*u*bee (the double variety).

Hind. Lall-Karpud, (the single rose-coloured), Suffet or shwet Karpud (single white), Padmu-Karpud (the double variety.)

Belutta-areli, *Rheed. Mal.* ix. *t.* 2.

Tsjovanna-areli, *Rheed. Mal.* ix. *t.* 1.

Common in gardens in every part of India, and in flower the whole year.

2. N. *coccinœum, R.*

Arboreous. *Leaves* sub-sessile, ovate-oblong, entire, apex alternate. *Flowers* terminal, three or four; nectarium acetabuliform. *Follicles* linear, rough.

P*u*llum, the vernacular name in Silhet.

II. 3

A native of the eastern frontier of Bengal, beyond the mouth of the Megna, from thence introduced by R. K. Dick, Esq. into the Botanic garden at Calcutta, where it blossoms in April. In its native soil it grows to be a large timber tree; the wood white, remarkably light, but firm, and much used by Turners to make palkees, &c. where light, strong wood is required.

Stem (in plants six or seven years old) short, but straight, and to the base decorated with numerous patent branches and branchlets. *Bark* of the ligneous parts ash-coloured and smooth; whole height from six to ten feet. Lactescent. *Leaves* opposite, very short-petioled, bifarious, ovate-oblong, entire, long, taper-pointed, smooth on both sides, dark green, from two to six inches long, and from one to two and a half broad. *Stipules*, some short bristles in the axil of the leaves. *Flowers* terminal, solitary, tern, twice tern, or more, with one in the forks, short-peduncled, and pedicelled, large, of a deep, but rather dull red. *Bractes* opposite, lanceolate, waved. *Calyx* divided to the base into five, nearly equal, sub-cordate, smooth segments, with somewhat waved margins. *Corol. Tube* very short, fleshy, sub-campanulate. *Border* divided into five, obliquely-obovate, thick, tough segments, soon after expansion they become revolute. *Nectarium* five-lobed; crimson-coloured; lobes with rounded, somewhat crenulate margins and firmly united to the base of the segments of the corol. *Filaments* very short and thick, inserted on the mouth of the tube of the corol, within the nectary. *Anthers* sagittate, united, and forming a conic dome over the stigma.

Germ two-lobed; each lobe one-celled, with numerous seeds attached to the incurved margins of the suture on the inside. *Style* cylindric. *Stigma* with two-lobed apex. *Follicles* two, linear, about as thick as the little finger, and nearly twelve inches long, olive-coloured, but rendered rough with elevated white specks. *Seeds* numerous, imbricated, linear-lanceolar, with very ample coma, pointing to the base of the follicle. *Integuments* two, the exterior one rather thick; the interior one a thin membrane adhering to the embryo. *Perisperm* none. *Embryo* inverse; cotyledons triangularly convolute. *Radicle* cylindric, superior (pointing from the coma to the apex of the follicle.) The whole almost exactly as in *Gærtner's Nerium Zeylanicum*, 2. *p.* 172. *t.* 117. Page Carey Ed. II. 4

3. N. *tinctorum*, *R.*

Arboreous. *Leaves* opposite, ovate-oblong. *Panicles* terminal. *Follicles* pendulous, very long, united at the apex.

Nerium indicum, &c. *Burm. Zeyl.* 167. *t.* 77.

Telinga. Chite-ancalloo.

A middling-sized tree, agreeing perfectly in its botanical character with *Nerium* of the *Linnean sexual system*, and from the quality of its leaves I have called it (*Nerium*) *tinctorium*. *Dyer's rose bay*, for to me it seems a new species; at least it is not taken notice of by *Linnæus*, nor by his son in his last Botanical publication, the *Supplementum Plantarum* published in 1781. It comes nearest Nerium *antidysenterium*, the tree which yields the Conessi bark of our Materia Medica, *Cadaga-pala* of the *Hortus Malabaricus*, *Pala Cudija* of the Telingas. They are both natives of the lower region of those mountains which bound the Rajamundry Circar on the north side, and are so much alike in most respects, (the Nectarium excepted) that without a tolerable knowledge of both, the one may be mistaken for the other; and I have no doubt but the bark of the *Nerium* may have been gathered and sold for *Conessi* bark to which I attribute the disrepute that has fallen upon *Conessi* bark in Europe; for with the natives of most parts of India it is deemed a specific in most complaints of the bowels. And I am inclined to think it deserves a better name than it has hitherto acquired amongst Europeans.

Trunk very irregular in shape, when very old it is from one and a half to two feet in diameter, but when of that size, it is full of large, rotten cavities; its height to the branches when large, is from ten to fifteen feet; the *bark* of the old wood is scabrous of the young pretty smooth, and ash-coloured. *Wood* remarkably white, close-grained, very beautiful, coming nearer to *Ivory* in appearance than any other I know. *Branches* irregularly disposed, being bent in various directions; small branches opposite. *Leaves* numerous, opposite, short-petioled, oval-pointed, pretty smooth, entire, pale green; when full grown from six to ten inches long, and from three to four broad. *Stipules* none. *Flowers* about an inch and a half in diameter, when fully expanded perfectly white, fragrant, disposed on lax globular panicles at the extremities of the branches. *Bractes* a small oval one below each sub-division of the panicle. *Calyx* divided into five equal semi-orbicular, permanent segments. *Corol* one-petalled. *Tube* short, somewhat gibbous. *Border* large, divided into five, oblique, linear-oblong, spreading segments. *Nectarium* many ramous, white filaments crowning the mouth of the tube of the corol, (no nectary in the *Conessi* bark tree). *Filaments* five, very short, rigid, inserted just within the mouth of the tube, and within the nectarium. *Anthers* arrow-shaped, rigid, united to one another laterally, forming a very firm, conical cover for the stigma, their lower parts inwardly are covered with fine white hairs. *Germ* two, seemingly united. *Style* the length of the tube. *Stigma*, double, covered with transparent gluten, by which it adheres to the inside of the anthers. *Follicles* two, very long, slender, pendulous, united at both ends singly, they are from twelve to twenty inches long; and about as thick as a common pencil. *Seeds* numerous, long, slender, crowned with down, like the seed of the common thistle. *Embryo* inverse, without perisperm, and the cotyledons rolled up in a compound manner between involute and convolute. II. 5

Obs. This tree as I observed before, is a native of the hills and lower regions of the mountains directly north from *Coringa* in the Rajamundry Circar, and delights most in the south or sunny side of these hills and mountains. I am informed that it also grows in great plenty over the *Carnatic*, and in every part of the Circars where there are hills or mountains, being an extent of above one thousand miles in length, and of breadth uncertain. II. 6

It contains a milky juice, chiefly in the tender branches and young leaves, which flows freely on being wounded. The natives make scarcely any use of it, except for fire-wood; and the more it is cut down, the more it increases: many shoots issuing from the old stumps, these in one year acquire various heights, from one to ten feet, according to the nature of the soil, &c. and are thick in proportion. It casts its leaves during the cold season; about the beginning of the hot season in March and the beginning of April, the young leaves begin to make their appearance, together with the flowers; by the end of the month (April,) those that first began to be unfolded, will have attained to their full size. This I have found to be the proper time to begin to gather the leaves, and make the indigo, about this time also it ceases flowering, and the seed vessels are fully formed, but the seeds are not ripe until January or February.

The colour the leaves acquired in drying for my Hortus siccus, particularly if they chanced to be bruised, first induced me to think they possessed colouring matter, and the result of some experiments fully answered my expectations; although I have been often deceived by the same appearances in the leaves of other plants. For an account of the method of making the indigo, see separate treatise.

4. N. *tomentosum*, *R.*

Arboreous. *Leaves* oval, pointed, downy. *Nectarium* of fleshy lacerated glands, on the mouth of the tube. *Anthers* without threads. *Follicles* divaricate, sub-cylindric.

Nelam-pala, *Rheed. Mal.* ix. *t.* 3 and 4.

Telinga. Poota-jeeleroo.

A small tree; a native of the mountainous parts of the Circars; flowers during the hot season. *Bark* rust-coloured, with small scabrous, light-coloured specks; the young shoots very downy. Every part of the plant discharges a yellow, milky juice on being wounded.

Leaves opposite, short-petioled, oval, pointed, both sides downy, from two to three inches long, and one and a half, or two broad. *Stipules* none. *Panicles* corymbiform, terminal, small. *Bractes* minute, caducous. *Flowers* pretty large, white; *nectary* orange-coloured. *Calyx*, the segments are ovate and obtuse. *Corol. Tube* gibbous, firm, somewhat fleshy. *Nectary* fleshy, and lacerated into obtuse, fleshy segments. *Anthers* arrow-shaped, converging; they terminate in a sharp rigid point without any thread. *Follicles* about eight or nine inches long, and two in circumference, scabrous.

Obs. With the yellow juice which flows from the wounded plant, diluted with water, bits of cotton cloth were died a pretty good yellow, which still continues bright as at first, now two years.—*Seeds* numerous, oblong compressed. *Coma* pure white and delicately fine. *Integuments perisperm* and *embryo*, as in the *Apocineæ*.

5. N. *pisidium. R.*

Leaves oblong entire, lucid. *Panicles* terminal brachiate shorter than the leaves. *Flowers* salver shaped. *Nectaries* bifid, and villous. *Follicles* oblong, obtuse, smooth, buffed.

Echaulut or Echalut the vernacular about Silhet.

II. 8 An extensive, perennial woody climber, a native of Silhet in Bengal; flowering in May and June seed ripe in January. Its bark, contains a quantity of fibrous matter, which the natives of the country where the plant grows, use as a substitute for hemp. In steeping some of the young shoots in a fish pond in order to accelerate the removal of the bark, and cleaning the fibres, many, if not the whole of the fish were killed, hence the specific name.

Stem and larger branches ligneous, and ramble to a vast extent. *Young shoots* long, round and smooth. *Leaves* opposite, short-petioled, oblong, taper-obtuse jointed, entire, firm and lucid; about six inches long, by two broad. *Panicles* terminal, sub-globular; composed of a few pairs of brachiate, short, few-flowered branches; all are round and smooth. *Flowers* many, large, pale yellow salver-shaped. *Bractes* oblong, rather obtuse, and small. *Calyx* five-leaved. *Leaflets* ovate smooth. *Tube* of the corol larger than the five obliquely trapiziform segments of its border, gibbous in the middle where the stamina are lodged. *Nectarium* consists of five bifid, villous segments, rising from the five fissures of the border of the corol, round the mouth of its tube. *Germ* two-lobed, two-celled, with numerous ovula in each, attached to an elevation down the centre of the partition. *Style* scarce half the length of the tube. *Stigma* large, with contracted bifid apex. *Follicles* ovate-oblong, while fresh very large, by being much inflated or puffed, smooth, obtuse, greenish yellow when ripe. *Seeds* many, thin, oval, with broad membranaceous margin, crowned. *Integuments* two, exterior, soft, smooth, light brown; interior, rather fleshy while the seeds are recent. *Perisperm* no other than the interior integument of the seed. *Embryo* inverse, *cotyledons* round-cordate, strongly marked with veins. *Radicle* cylindric, superior.

6. N. *reticulatum, R.*

Shrubby, twining. *Leaves* oblong, smooth. *Cymes* axillary. Nectarial scales five, wedge-

II. shaped.

9 Kalli-pal-valli. *Rheed. Mal.* 9. *t.* 11.

Apocynum *reticulatum.* B. H.

Teling. Adivi pala-tiga.

Hind. Karunta.

A large twining shrub, a native of hedges, thickets, &c. Flowering time the rainy season, abounds with milky juice.

Leaves opposite, short-petioled, obovate, or oblong, entire, smooth, very pale underneath; with numerous, small, reticulated veins running through every part, from three to six inches long. *Cymes* axillary, many times shorter than the leaves, and short pedunceled, many-flowered. *Flowers* small, yellow. *Calyx* five-parted; *division* short, ovate. *Corol: tube* very short, gibbous; *divisions* of the border linear-lanceolate. *Nectary* five wedge-formed scales, inserted on, or rather in the mouth of the tube. *Stamens* within the tube, below the nectarial scales. *Style* short. *Stigma* peltate, five-sided. *Follicles* lanceolate, horizontal, about three inches long.

7. N. *chinensis, Hunter.*

Shrubby, with erect, dichotomous branches. *Leaves* sub-sessile, ovate-lanceolate, smooth. *Peduncles* terminal, becoming lateral, or in the forks of the branches, few-flowered. *Segments* of the corol narrow, and end ensiform. *Stamina* in the base of the tube.

A native of China. In one garden on Pulo-Penang Dr. Hunter found it in blossom in July.

I can find no nectarial crown on the tube of the corol, hence I suspect it to be an Echites.

8. N. *caudatum, R.*

Shrubby, scandent. *Leaves* oblong, smooth. *Cymes* terminal. *Segment* of the corol

II. ending in long, filiform points.

10 A large climbing shrub, a native of the mountainous parts of the Coast, bark ash-coloured with scabrous specks.

Leaves opposite, short-petioled, oval, waved, smooth, shining. *Corymbs* terminal, two-forked. *Bractes* narrow-lanceolate, revolute. *Flowers* large, pretty numerous. *Calyx* five-cleft; *divisions* linear, waved, revolute, coloured, very much like the bractes. *Corol; tube* contracted at the middle, each of the segments of the border ending in a large linear filament, as in *Echites caudata*. *Nectary* crowning the mouth of the tube as in the family. *Anthers* within the tube, and ending in filaments as in the genus. *Germs* two. *Style* length of the tube, white, ragose as if it were composed of small air bladders. Page Carey Ed.

I know of no use any part of this plant is put to. If Burman's *Echites caudata* is the same, the nectary, and threads to the anthers, are omitted in his figure. *Flora Indica Table* 26. Is allied to De Candoll's *Strophanthus.*

9. N. *grandiflorum, R.*

Shrubby, twining. *Leaves* oblong, polished. *Flowers* terminal. *Nectaries* bifid. *Follicles* three-sided horizontal.

A native of the Peninsula of India. In the Botanic garden at Calcutta it is in flower great part of the year though the seeds do not often come to maturity.

Stem stout, and woody. *Bark* smooth, greenish ash-colour. *Branches* twining up and over trees of very considerable size, every part abundantly lactescent when wounded. *Leaves* opposite, short-petioled, oblong, entire, obtuse-pointed, polished on both sides; underneath minutely reticulated, about three inches long, by one and a half broad. *Flowers* terminal, from one to many, forming a dichotomous raceme with one in the fork, very large pale pink. *Bractes* conically-lanceolate, opposite, caducous. *Calyx* five-leaved. *Leaflets* oval-lanceolate, with ample, thin curled margins. *Corol* campanulate, half five-cleft. *Nectaries* five, not alternate with, but attached to the tube of the corol immediately above the stamina; each divided into two long, filiform, coloured segments. *Filaments* short, inserted on the contracted base of the tube of the corol. *Anthers* cordate, incurved in form of a dome over the stigma. *Germs* two, one-celled, each containing many ovula attached to a large projecting fleshy receptacle on the inside. *Style* at the base double and coalescing into one body near the top. Stigma single, large, globular, with the vertex two-toothed, and five glands round the side, which are firmly attached to the inside of the five anthers near their base, between these are five dark-coloured, spoon-shaped scales, which become detached by age. *Follicles* horizontal, three-sided, with the angles sharp; tapering to a long, incurved, rather obtuse beak. II. 11

ECHITES.

[By some accident the Generic Character of Echites, and the description of the three first species, viz. Antidysenterica, Tinctoria, and Scholaris are wanting in my copy of Dr Roxburgh's work; The two first of these are now removed to Wrightea, and the last to Alstonia. It is thought better to print the genus as it stands with this deficiency than to insert a generic character of the genus, and a description of the three species which would not be Dr. Roxburgh's. *W. Carey.*]

4. E. *caryophyllata, R.*

Twining. *Leaves* ovate-cordate, pointed. *Cymes* terminal. *Tube* gibbous at top. *Nectary* tubular, five-toothed. *Segments* of the corol, triangular.

Sans. Malati. *See Asiat. Res.* iv. 246.

Kemetti valli. *Rheed. Mal.* ix. *t.* 135.

Compare with E. *costata Willd.*

This is a large twining shrub, a native of mountainous tracts only. It flowers during the wet season; the flowers are delightfully fragrant, partaking much of the smell of cloves. *Stem* woody, twining, as thick as a man's leg. *Bark* dark rust-colour, with fissures and scabrous specks. *Leaves* opposite, short-petioled, ovate-cordate, pointed, entire. *Petioles* with the nerve and veins coloured red. *Cymes* terminal, sub-globular. *Bractes* falling. *Flowers* numerous, large, pure white, delightfully fragrant. *Calyx* five-leaved, leaflets lanceolate, as long as the corol, somewhat coloured, on the outside a little downy. *Corol; tube* five-sided, gibbous; *segments* of the border large, triangular. *Nectary* and pistillum as in other species. *Follicles* cylindric, spreading. *Seeds* a few, very large, crowned with down. II. 12

The delightful smell of the flowers of this plant, as well as their beauty, makes it highly deserving a place in the flower garden. On my arrival in Bengal I found it in a few gardens only.

5. E. *frutescens. R.*

Twining. *Leaves* oblong, pointed. *Panicles*, terminal; *segments* of the corol long twisted and hairy; *tube* gibbous above the middle. *Nectary* of five headed filaments. *Follicles* linear.

A. floribus fasciculatis. *Burm. zeyl.* 23. *t.* 12. *f.* 1.

Syama. *Asiat. Res.* iv. 261.

Beng. Syama-luta.

Teling. Nalla-tiga.

This plant Dr. König thought was *Apocynum frutescens* of *Linnæus.* It is a large, ramous, twining, shrubby species; common in hedges, &c.

Leaves opposite, short-petioled, oblong, or broad-lanceolate, pointed, smooth, entire; from one to two inches long. *Panicles* terminal; *ramifications* opposite. *Flowers* small, white, inodorous. *Corol. Tube* gibbous where the stamens are lodged; *mouth* contracted, and shut with hairs; *segments* of the border linear, twisted hairs. *Nectary* five subulate bodies with large recurved heads, surrounding the germs. *Style* single, of a length sufficient to bring the large, compound *Stigma* in contact with the anthers. *Follicles* and seeds as in the genus. II. 13

Page Carey Ed.

6. E. *macrophylla, R.*

Shrubby, twining. *Leaves* sub-rotund acuminate, downy underneath. *Cymes* terminal.

Belutta-kaka-kodi. *Rheed. Mal.* ix. *t.* 5 and 6.

Harkee the vernacular name in Silhet; where it is indigenous. Flowering time the hot months of May and June; the seeds do not ripen until the following March or April. *Stem* and larger branches ligneous, twining, young shoots marked with little elevated brown specks. *Leaves* opposite, short-petioled, from oval to roundish oval, entire, acute, downy underneath; from ten to twelve inches long by from seven to ten broad. *Cymes* terminal, elevated on a strong erect peduncle, many-flowered. *Flowers* very large, white. *Bractes* opposite, at the divisions of the cyme, ovate, acute. *Calyx* companulate, five toothed. *Corol* infundibuliform. *Tube* gibbous immediately above the base where the anthers are lodged; segments of the border unequally obovate, spreading. *Filaments* short, hairy. *Anthers* sagittate, united at the sides into a cone over the stigma. *Germ* superior, ovate, two-lobed, two-celled, with many ovula in each, attached to the thick middle of the partition. *Style* short, grooved, as if composed of two portions firmly united. *Stigma* headed, with an acute, bidentate apex. *Follicles* pendulous, about twelve inches long, and as thick as the little finger, tapering to an acute point, pretty smooth. *Seeds* numerous, large, spatulate; *coma* ample, pointing to the apex of the follicle; the reverse of Nerium coccinum. *Integuments* single, firm, and brown. *Perisperm* in small quantity; in fact an interior integument. *Embryo* inverse. *Cotyledons* oblong.

II. *Radicle* sub-cylindric, superior, and pointing to the *coma.*

14 7. E. *grandiflora, R.*

Scandent. *Leaves* cuneate-oblong. *Cymes* terminal, and axillary. *Leaflets* of the calyx lanceolar, waved, and coloured. *Corol* companulate. *Follicles* linear.

A native of the hilly parts of *Chittagong* and *Silhet,* where it blossoms during the dry season. The seeds take nearly one year to ripen.

Stem and large branches ligneous, and scandent to a very great extent, young shoots villous. *Leaves* opposite, short-petioled, from oblong-cuneiform, to obovate-oblong, entire, apex rounded, with a short point; void of pubescence, hard; from six to eight inches long by from two to five broad. *Cymes* axillary, becoming lateral, short, few-flowered, all the parts thereof clothed with ferruginous down. *Flowers* very large, equalling those of *Solandra grandiflora;* greenish yellow. *Bractes* oblong, coloured and veined. *Calyx* to the base divided into five long, lanceolate, waved, acute, coloured, veined segments. *Corol* campanulate; *border* expanding about five inches, and divided into five oval, waved, rather acuminate, broad segments. *Filaments* five, nearly as long as the corol, ascending in a gentle curved, smooth, inserted into the base of the bell of the corol. *Anthers* sagittate, sides firmly united, forming a conical cover for the stigma, to which they cohere. *Germ* two-lobed, hairy, two-celled; *ovula* numerous, attached to a jugiform receptacle in each cell, rising from the partition. *Style* length of the stamina, *Stigma* large, clammy. *Follicles* horizontal, linear, obtuse, pretty smooth, the thickness of the little finger; points rather incurved, and obtuse; from six to ten inches long. *Seeds* numerous, imbricated, oblong, compressed, brown, comose; *coma* very ample. I have rarely seen so large points to this apex of the follicles. *Perisperm* thin, light grey. *Embryo*

II. straight. *Cotyledons* oblong. *Radicle* long-cylindric, superior.

15 8. E. *acuminata, R.*

Shrubby, scandent. *Leaves* from oblong to broad-lanceolate, acuminate. Panicles axillary, longer than the leaves, diffuse, trichotomous, segments of the corol linear and falcate. *Follicles* filiform, about eight inches long.

Pingoree, or Bengeree the vernacular name in Silhet, where the plant is found in the forest, climbing up and over trees, &c. to a large extent. *Flowering* time May; the seeds ripen in about nine months.

Young shoots rather rough with little, lighter coloured, elevated specks. *Leaves* opposite, short-petioled, broad-lanceolate, entire, acuminate, smooth; from two to four inches long, by one and a half broad. On young plants linear-lanceolate, and waved. *Panicles* axillary, solitary in one axil, the other vacant, longer than the leaves, lax, trichotomous throughout, smooth. *Flowers* many, large, white, and fragrant. *Bractes* opposite, long, slender, and smooth. *Calyx,* large divided to the base, into five, long, narrow smooth segments. *Corol. Tube* the length of the calyx, enlarged at the base, the border cut in to five long, narrow, falcate, curled segments, which are imbricated in the bud. *Nectary* cup-shaped, embracing the base of the germs, obscurely five-toothed. *Filaments* five, short, attached to the tube a little below the middle. *Anthers* sagittate, completely within the mouth of the tube. *Germs* two, or very completely two-lobed, each one-celled, containing numerous ovula, attached to a grooved vertical receptacle on the inside. *Style* half the length of the tube. *Stigma* large, oblong, bidentate. *Follicles* pendulous about a foot and a half long, and not thicker than a goose-quill, dark brown, marked with small lighter coloured specks. *Seeds* many, crowned with an ample *coma,* which points to the apex of the follicle. *Perisperm* scarcely any. *Embryo* inverse.

II. 9. E. *marginata, R.*

16 Shrubby, scandent. *Leaves* lanceolate; an anastomosing vein near the margin. *Panicles* terminal, corymbose.

Dood-luta the vernacular name in Silhet, where it is indigenous climbing up, and over trees, &c. Flowering time April and May when the air is perfumed with its fragrance.

Leaves opposite, short-petioled, lanceolate, entire, smooth, veins large, apices anastomosing and forming a waved line within the margin; from two to six inches long. *Panicles* terminal, longer than the leaves, lax, corymbiform; first ramifications opposite, i. e.

sub-trichotomous afterwards dichotomous; all smooth. *Bractes* ensiform. *Flowers* many, large, white, fragrant. *Calyx* five-leaved; *leaflets* ensiform. *Tube* of the corol gibbous at the base, the stamina lodged near the middle. *Segments* of the border five, linear, falcate. *Nectary* a ring round the base of the germ. *Germ* two-lobed; *ovula* in each lobe numerous, attached to a projecting receptacle down the centre of the partition. *Style* half the length of the tube of the corol. *Stigma* large, oblong, bidentate. Page Carey Ed.

10. E. *cymosa. R.*

Shrubby, hairy. *Leaves* elliptic, acuminate. *Cymes* terminal, shorter than the leaves, crowded. *Calyx* five-leaved, length of the corol. *Nectary* poculiform, with five-toothed mouth.

Kasee. Ewtaesbrab.

A native of the copses, or low jungle in the Silhet district, where it grows to be a middle sized, ramous shrub; flowering in May.

Young shoots hairy.

Leaves petioled, opposite, elliptic, acuminate, hairy, particularly underneath; from three to four inches long, by from one and half to two and half broad. *Cymes* terminal, sub-globular, much shorter than the leaves, crowded with small dull white, fragrant flowers. *Bractes* ensiform, hoary. *Calyx* of five, hoary, ensiform leaflets, scarcely united at the base, and as long as the tube of the corol. *Corol* hoary on the outside. *Tube* gibbous; border of five, obliquely ensiform segments, which are shorter than the tube, and white in bud, imbricated. *Nectary* poculiform, embracing very completely the whole germ; *mouth* five-toothed. *Anthers* within the tube, sagittate. *Germ* of two distinct lobes, their apices very hairy, each lobe one-celled, and containing numerous ovula attached to a vertical ridge on the partition. *Style* short. *Stigma* large, acuminate, adhering by gluten to the inside of the anthers. II. 17

8. E. *paniculata, R.*

Shrubby, scandent. *Leaves* broad-lanceolar, entire, smooth. *Panicles* axillary and terminal, trichotomous throughout. *Nectary* cup-shaped, surrounding the germ, five-toothed. *Follicles* obclavate, few-seeded.

An extensive, powerful, woody rambler; a native of the forests of Silhet. Flowering in March and April, the seeds from the flowers of the former year ripening about the same time.

Young shoots round and perfectly smooth. *Leaves* opposite, short-petioled, broad-lanceolar, smooth and of a very firm texture, entire, obtuse-pointed; from four to eight inches long, and from one and a half to three broad. *Stipules* none. *Panicles* axillary, and terminal, longer than the leaves, smooth in every part, throughout trichotomous to the extreme divisions, and they are three-flowered. *Bractes* oval, embracing the base of the divisions. *Flowers* very numerous, and very small, pale-yellow. *Calyx* five-parted. *Corol* with a short gibbous tube, and border of five, falcate, woolly-margined segments. *Nectary* cup-shaped, five-toothed, embracing the lower half, or more, of the germ. *Filaments* short. *Anthers* sagittate, adhering to each other, in the gibbous part of the tube, and forming a dome over the stigma. *Germs* two-lobed, two celled, &c. *Style* very short. *Stigma* very large, with a pointed, bifid apex. *Follicles* horizontal, five or six inches long, as thick as the little finger at the base, and from thence tapering to an obtuse point, smooth. *Seeds* a few, with an immensely long and large coma to the *apex* and *Embryo*, as in the *Asclepiadæ*. II. 18

9. E. *hircosa, R.*

Twining. *Leaves* petioled, oval, smooth. *Panicles* axillary, globular, and open. *Anthers* exsert, a pearl like gland on the back.

Pergularia *glabra. Willd.* 1. 1247.

Flos *pergularia. Rumph. amb.* 51. 29. *f.* 2.

A pretty extensive, perennial, twining shrub; a native of *Bengal*, but scarce. The flowers are pretty white, larger and more numerous than in *dichotoma*, but have a very offensive smell, truly goatish, as noticed by Rumphius. It flowers about the end of the hot season, and the beginning of the rains in May and June.

Leaves opposite, rather short-petioled, oval, somewhat pointed, entire, smooth; from three to five inches long, and from two to three broad. *Panicle* axillary, shorter than the leaves, sub-globular, very open, though very ramous, slightly villous. *Flowers* large, pure white, long pedicelled. *Bractes* from lanceolate to ensiform. *Calyx* 5-parted; *segments* sub-lanceolate, acute. *Corol* with a short, rather gibbous tube. *Border* of several round spreading segments; which are imbricated in the bud. *Nectary* of five, fleshy, smooth scabs, covering the germ. *Filaments* five from the mouth of the tube, thick, and short. *Anthers* sagittate, forming a pointed cone over the stigma on the base; on the outside a large, beautiful pearl-like gland. *Germ* hairy, two-lobed, 2 celled; *Ovula* numerous, attached to an elevated vertical receptacle on the partition. *Style* longer than the tube of the corol, columnar. *Stigma* large, clammy, and adhering to the anthers, apex two-toothed. II. 19

13. E. *dichotoma, R.*

Twining. *Leaves* opposite, lanceolate-oblong.

Racemes axillary, dichotomous. *Segments* of the corol obovate. *Filaments* thick, headed, and woody.

Beng. Happur-malee.

Pergularia *glabra, Kön. in B. H.*

A large, twining, shrubby plant, found in forests, &c. near *Calcutta*; flowering time, the

Page Carey Ed.

hot season. *Stems* ligneous. *Branches* numerous, spreading and twining; *bark* of the wood part ash-coloured, of the young shoots green and smooth. *Leaves* opposite, very short-petioled from oblong to lanceolar, acute, recurved, entire, smooth; from two to three inches long, an from one, to one and a half broad. *Stipules*, some awl-shaped, brown glands surrounding th insertions of the leaves. *Racemes* axillary, or a little above, solitary, generally two-cleft, o two racemes to a common peduncle, rachis winding. *Flowers* alternate, generally solitary pretty long-pedicelled, large, pure white, pleasantly fragrant. *Bractes*, a few of an unequa size at the insertion of each pedicel. *Calyx* of five, cordate, pointed leaflets; the length of th tube of the corol. *Corol* tubular; *tube* short; *border* large, flat; *divisions* roundish-obovate *Nectary* cylindric, surrounding the germs; *mouth* five-notched. *Filaments* inserted on th mouth of the tube of the corol, very thick, with a large round pearl coloured projection be hind the insertion of the arrow-shaped *anthers*, which are woolly on the fore side. *Germs* tw &c. as in the former species. *Style* single, hairy. *Stigma* headed, and adhering firmly to projection in the fissure which forms the barb of the anthers. *Follicles* oblong, large, being

II. 20

about six inches long, and above two in diameter at the thickest part, and what is most extra ordinary, the only few seed vessels which I have yet met with, divided spontaneously into fou parts or equal valves, when dry. *Seeds* numerous, comose, &c. with inverted embryo, as in th other *Apocineæ*.

14. E. *parviflora. R.*

Twining. *Leaves* lanceolar. *Panicles* terminal, and axillary, brachiate. *Tube* of the co rol gibbous toward the base; *segments* of the border linear-falcate. *Nectary* an entire ring round the germ.

A stout perennial species, a native of the northern Circars.

15. E. *clavata, R.*

Twining, dichotomous. *Leaves* broad, lanceolate, entire, villous underneath. *Panicles* axil lary, dichotomous. *Tube* of the corol clavate, with the *segments* of the border falcate. *Anther* linear, and within the mouth of the tube.

A native of the *Moluccas*, and of all the species known to me, this most resembles *E. Dichotoma*, but differs sufficiently in the length of the tube, the segments of the border of th corol, and the stamina, to authorise its being considered a distinct species.

PLUMERIA. Schreb. gen. N. 422.

Calyx 5-parted. *Corol* infundibuliform. *Germ* 2-celled; *cells* many-seeded, attachmen interior. *Follicles* reflex. *Seeds* inserted into their proper membrane.

P. *acuminata* of the *Banksian herbarium.*

Arboreous. *Leaves* cuneate-lanceolar, acuminate, those of the branchlets obtuse. *Raceme* corymbose.

Flos convolutus. Rumph. Amb. 4. *t.* 38 *good.*

Hind. Gool-achin.

II. 21

This very elegant, small tree does not appear to be a native of this part of *India*. I hav only found it in gardens; but there it is very common, which shews it to be of considerabl antiquity. Every part is full of tenacious, white juice, which exudes plentifully on being wounded. *Trunk* crooked, from six to ten feet high. *Bark* rough. *Branches* numerous three-forked, swelled towards the ends; the height of the whole tree fifteen or twenty feet *Leaves* crowded about the end of the branchlets, petioled, wedge-lanceolar, acute, entire Many straight veins run towards the circumference, and are lost in another waved vein, whic surrounds the leaf within the margins; they are smooth on both sides; about a foot long an three inches broad. *Petioles* round, with a small channel on the upper side, which ends belo in a hollow filled with blackish conical glands. *Peduncles* sub-terminal, having several co rymbiform racemes, in a verticelled order. *Flowers* numerous, succeeding one another for great length of time; on the outside they are tinged red; the inside pale yellow below, an white towards the base of the segments; diffusing a pleasing fragrance, chiefly during th night. *Calyx* of five, small, roundish, fleshy leaves. *Corol* funnel-shaped, with a large im bricated border; *divisions* obovate. *Stamens* in the bottom of the tube. *Filaments* short *Anthers* sagittate. *Follicles* pendulous, horizontal, very rigid. In thirty-five years I hav only met with them once, so rarely does this tree ripen its seed.

TABERNÆMONTANA.

Contorted. Corol funnel-shaped. *Follicles* two, recurved. *Seeds* several, immersed i a pulpy aril, and alternately attached to the two margins of the follicles.

1. T. *dichotoma. R.*

Sub-arboreous, dichotomous. *Leaves* oblong, and linear oblong, with diverging veins *Racemes* simple or compound, single, or in pairs from the forks.

II. 22

A native of Ceylon and Malabar and introduced into the Botanic Garden at Calcutt from the former place, by the Rev. Dr. John; where it flowers during the greater part of th year, but chiefly during the rains.

Trunk short.

Branches numerous; spreading much in every direction, dichotomous, the old ones wit smooth olive coloured bark; the young ones green, round, and very smooth. *Leaves* opposite petioled, oblong, and linear-oblong, entire, rather obtuse, of a firm texture, and polished o both sides; veins parallel, diverging from the rib; length from four to eight inches and fro one to two broad. *Petioles* short, and united in a cup like a stipulary ring which completely

embraces the branchlets. All these parts very resinous. *Racemes* simple or compound; single or in pairs, in the extreme divisions of the branchlets; often as long as the leaves, polished, bright green. *Flowers* rather remote, long-pedicelled, large, white, scarcely fragrant. *Bractes* scarcely any. *Calyx* five-parted; *divisions* short, semilunar, resinous. *Corol; tube* long, gibbous near the base, much contracted above the stamina; *Border* of five, contorted, falcate segments. *Filaments* short, inserted into the tube of the corol near the middle. *Anthers* sagittate. *Germs* two, closely united; single, one-celled; *ovula* numerous, attached to a two-lobed receptacle, on the inner side of the cell. *Style* two-thirds shorter than the tube of the corol, two-lobed. *Stigma* large, with a tapering bifid apex. *Follicles*, it is rare to find more than one of the two come to maturity, they are recurved with the back considerably concave; and very gibbous on the opposite side, where an elevated rib runs along each side of the suture; obtusely pointed, pretty smooth; when ripe of a bright orange colour, four or five inches long, and nearly two in diameter where thickest. *Seeds* numerous, of an irregular, cuneate-oblong shape, with a deep longitudinal groove on one side; each enveloped in its own proper, scarlet, pulpy aril and inserted along the side of the two margins of the suture by the small end of the aril, which is again attached by a broad umbilical cord to the centre of the longitudinal groove just mentioned. *Perisperm* in pretty large quantity, rather soft, and of a pale bluish white colour. *Embryo* nearly as long as the seed, with the two cordate cotyledons lodged near the thick end; and the long, almost straight cylindric radicle directed to the small end where the aril was attached to the margin of the follicle; *(relative centripeta of Gærtner.)*

Page Carey Ed. II. 23

An incomplete drawing, and description of this tree, was sent to the Honourable the Court of Directors under the name of *Cerbera dichotoma*, and numbered 1541. At that time I had not seen the fruit but since my return to India, I have met with it in a perfectly ripe state and find the plant must now be referred to the genus *Tabernæmontana* where, I think, it forms a new species.

2. T. *coronaria. R.*

Shrubby, dichotomous. *Leaves* lanceolar, waved, smooth. *Peduncles* from the divisions of the branches few-flowered. *Calyx* 5-toothed. *Follicles* recurved, many-seeded.

Nerium *coronarium. Hort. Kew.* 1. *p.* 297.

Nandi-ervatum major, and minor. *Rheed. Mal.* 2. *t.*

54. *and* 55. I take to be the double and single varieties of this.

Firki-tugur the Hindoo name of the single flowered, and *Bura-tugur* of the double flowered.

Jasminum zylanicum. &c. Burm. zeyl. 129. *t.* 59.

Flos Manilhanus. Rump. Amb. 4. t. 49. appears to be the double variety.

A flowering shrub common in gardens over India. It is in flower the greater part of the year but rarely ripens its seed. I mean the double sort, the single ripens them frequently.

II. 24

Trunk trifling, but numerous, two-forked branches, with a pretty smooth light ash-coloured bark. The whole shrub is about 6 or 8 feet high. *Leaves* opposite, short-petioled, spreading, lanceolar, smooth, shining, deep green; margins waved a little, with elevations above the veins; four or six inches long. *Stipules* within the leaves, resinous as in most species of *Gardenia*. *Peduncles* generally solitary, from the divisions of the branchlets, one or two inches long, from one to eight flowered. *Flowers* pure white, and deligthfully fragrant during the night. *Calyx* five-toothed. *Corol* funnel-shaped; *tube* contracted towards the mouth, and crowned with small yellow glands, (which brings it in this respect near to Nerium;) *border* five-parted; divisions obliquely ovate, and curled at the margins. *Stamens* rather below the middle of the tube. *Germs* two. *Style* short. *Stigma* single, headed with its slender apex, bifid. *Follicles* spreading; and recurved singly, from one to three inches long. *Seeds* three to six, irregularly oblong, dark brown, and striated; each enclosed in its own proper, fleshy, deep red pulpy aril. *Perisperm* conform to the seed; with the cordate *cotyledons* lodged in its thick end, and the long, cylindric, straight radicle, directed to the small end.

Note. This pulp seems fit for yielding a very beautiful colour. The double flowered variety is much more common than the single and is more beautiful; few shrubs surpassing it.

3. T. *Crispa. R.*

Shrubby, dichotomous. *Leaves* oblong, pointed, waved, smooth. *Peduncles* from the divisions of the branches, three or four flowered. *Calyx* five-leaved. *Follicles* three or four seeded.

4. T. *alternifolia. Willd.* 4. 1246.

Curutu-pala. Rheed. mal. 1. *p.* 83. *t.* 46.

II. 25

This is a large, ramous shrub. I have only found it in the Botanic Garden of the Company at Calcutta, where it flowers during the rains.

Trunk short; *branches* numerous, two-forked; *bark* ash-coloured; *young shoots* dotted. *Leaves* opposite, cross-armed, short-petioled, reclined, oblong, pointed, waved, pale green, but smooth on both sides; from 4 to 8 inches long and two or three broad. *Peduncles* from the divisions of the branchlets, solitary, few flowered. *Flowers* pure white, fragrant. *Calyx* five-leaved, *leaflets* cordate, smooth, falling. *Corol; tube* a little gibbous above the middle, and there the stamens are lodged; *divisions* of the border curled. *Germs* two, each one-celled, containing four vertical rows of *ovula*, two on each side, attached to the inner elevated margins of the cell. *Follicles* oblong, three-six-seeded. *Seeds* surrounded with their pro-

Page Carey Ed. per pulpy arils, &c. &c. as in *T. Coronaria.*

I never saw this species with double flowers, nor is it so ornamental as even the single flowered. *T. Coronaria.* To distinguish it from that species, attend to the calyx, and follicles chiefly, the leaves being in this also opposite, made me change the Linnæan specific name *alternifolia*, for *crispa* on account of its curled petals.

T. corymbosa. R.

Leaves petioled, oblong. *Corymbs* terminal, ample, decompound, all the primary divisions dichotomous. *Anthers* inclosed.

A native of the Moluccas.

T. parviflora. R.

Shrubby, dichotomous. *Leaves* broad-lanceolate, taper, obtuse pointed. *Peduncles* in
II pairs at the forks, few-flowered. The five segments of the calyx ensiform.
26 This small shrub, was sent from Sumatra to the Botanic Garden at Calcutta, where it flowers during the rainy season; but has not yet perfected its seeds in Bengal.

Stem erect, slender, round, and smooth, soon dividing into a few, slender, dichotomous branches, the whole height rather under three feet. *Leaves* opposite, short-petioled, broad-lanceolate, taper, obtuse-pointed; *margins* waved, but entire, smooth on both sides, length from two to six inches and the breadth from one to two. *Peduncles* generally in pairs from the forks of the branches, few-flowered. *Flowers* pedicelled, small, white. *Pedicells* as long as the peduncles. *Bractes* few and small. *Calyx* five-toothed. *Divisions* erect, ensiform. *Corol* infundibiliform; *tube* widest close to the mouth, and there the sessile *anthers* are lodged. *Border* of five falcate, linear, obtuse *segments*, which are shorter than the tube. *Germ* two-lobed; *style* of two, coalesced portions, and sufficiently long to elevate the *stigma* even with the anthers.

T. recurva. R.

Shrubby, dichotomous. *Leaves* broad-lanceolar, smooth. *Peduncles* in pairs at the forks, recurved, corymbiform. *Calyxes* five-cleft. *Anthers* in the mouth of the clavate tube.

A native of Chittagong from whence it was sent to the Botanic Garden at Calcutta by Dr. Buchanan, where it blossoms in March and April.

Trunk tolerably straight, but short, soon dividing into several, dichotomous *branches*. *Bark* smooth. *Leaves* opposite, short-petioled, broad-lanceolate, obtuse-pointed; smooth on both sides; length from two to six inches. *Peduncles* in pairs from the divisions of the branchlets, short, recurved, each ending in a dichotomous corymb of many, long, white, drooping flowers. *Bractes* lanceolate. *Calyx* five-cleft to very near the base; *divisions* linear, un-
II. equal, smooth. *Corol; tube* many times longer than the calyx, widened at the mouth, where
27 the anthers are lodged. *Border* of five, large, wedge-shaped, very obliquely, smooth, entire segments. *Fil* short. *Anthers* sagittate, lodged just within the tube of the corol. *Germ* two-lobed. *Style* nearly as long as the tube of the corol. *Stigma* bifid, issuing from the apex of an enlarged glutinous gland.

T. persicariafolia. Willd. 1. 1246.

Arboreous. *Leaves* opposite, lanceolar. *Panicles* terminal and axillary, small, dichotomous. *Follicles* many-seeded.

A small tree, with smooth opposite and dichotomous branches and branchlets. *Flowers* rather small, pale yellow.

PENTANDRIA DIGYNIA.

CEROPEGIA. Schreb. gen. N. 431.

Calyx five-toothed. *Corol* with the divisions of its borders converging. *Nectary* surrounding the fructification, protruding five sterile filaments. *Follicles* linear. *Seed* comose.

1. C. *Candelabrum. Willd.* 1. 1275.

Perennial, twining, smooth. *Leaves* ovate-oblong. *Umbels* pendulous.

Njota-njoden-valli. *Rheed. Mal.* 9. *t.* 16.

Native of Malabar. It flowers in the rainy season in the Botanic Garden at Calcutta.

II. 2. C. *bulbosa. Willd.* 1. 1275. *R. Corom. pl.* 1. *N.* 7.
28 *Root* tuberous, perennial. *Stems* herbaceous, twining. *Leaves* obovate, short-petioles, fleshy. *Umbels* short-peduncled, few-flowered.

Teling. Manchi, viz. good Mandu.

It grows amongst bushes in hedges, &c. on dry, barren, uncultivated ground and flowers during the hot season.

Root tuberous, a little flattened like a turnip, with several fibres from its base; it is about as large as a small apple. *Stems* twining, herbaceous, smooth, succulent; from 2 to 4 feet long. *Leaves* opposite, short-petioled, obovate, with a small point, entire, fleshy, size various. *Umbels* lateral, length of the leaves, peduncled few-flowered, direction various. *Flowers* pretty large, erect; *tube* greenish; *border* purple. *Calyx* five-toothed; *toothlets* acute, permanent. *Corol* one-petalled; *tube* swelled at the base, contracted about the middle, enlarging from thence into a bell-shaped mouth. *Border* five-parted; *segments* linear, downy, purple, erect, tops united, gaping at the sides. *Nectary;* its body is already described in the preliminary observations; from each of its five divisions, rises a curved tapering, filiform, sterile filament, of about half the length of the tube. *Anthers* five pair, resting on the black pointed angles of the *common stigma. (Corpus truncatum.) Germs* two united. *Styles* two, united, short thick. *Stigma* common large, peltate, five-cornered, before the flower opens these corners

adhere firmly to five, incurved, yellow glandular parts of the nectary, and between them are the anthers. It requires some force to separate them, to have a view of the anthers; when the flower is afterwards fully blown, they separate of themselves, the anthers are then seen poised, as it were, on the five black, pointed angles of the stigma. *Follicles* two, slender, singly about 3 or 4 inches long. Page Carey Ed.

Every part of this plant is eaten by the natives, either raw or stewed in their curries. The fresh roots taste like a raw turnip. II.

3. C. *acuminata. Willd.* 1. 1276. *R. Corom. pl.* 1. *N.* 8. *Root* tuberous, perennial. *Stems* herbaceous, twining. *Leaves* ensiform, succulent. 29

Teling. Commoo-madu.

ASCLEPIAS.

Contorted. Calyx five-toothed. *Corol* rotate, or salver-shaped. *Nectary* subcylindric, embracing the organs of the fructification. *Anthers* five pairs, attached to the five angles of the common stigma. *Follicles* two. *Seeds* comose.

The East Indian plants of this extensive family, belonging to the natural order *Apocinea* of Jussieu, are, with the exception of two or three species, uniformly twining perennials. The *Leaves* always opposite; inflorescence sub-axillary or other laterifolius umbells. The *Calyx* and *Corol* five-parted. The *nectary* a subcylindric pentagon, more or less deeply divided into five, lanceolate, lamellated segments. The organs of the *fructification* consist of five pair, of one-celled *anthers* and as I cannot subscribe to Brown's opinion, I must say at all periods attached to the circumference, or when angular, to the five angles of the *common stigma*, and furnished with a *fecundating fluid*, instead of pollen. The *germs* two, or very perfectly two-lobed, superior, each crowned with its proper *style*, but the two are often pretty firmly united, and end in a single large, roundish, or pentagonal, spongy body, which I call the *common stigma*, (Jacquin's *tuberculum staminiferum*, and Cavanille's *radix stamineum*) and gives the germs nearly as great a claim to the first order of this class, as the other parts of the pistillum do to the *second.* This body is in some parts firmly attached to the interior lamella of the five segments of the *nectary*, and that organ being united to the *Corol*, the whole falls off in one body. Several of our Indian plants of this order hitherto consigned to *Pergularia, Periploca, Cynanchium*, and *Apocynum*, fall into this genus; nor can I contrive any possibility of placing them elsewhere, so exactly alike are all the essential parts of their *generic character*, which appears to me as completely *Gynandrous*, as any of the *Orchideæ.* II. 30

Section 1st. Corol rotate.

1. A. *gigantea. Willd.* 1264.

Shrubby, hoary. *Leaves* stem clasping, oblong, obovate, downy underneath. *Umbels* simple.

Madorous. *Rumph. amb.* 7. *t.* 14. *f.* 1.

Urka is the Sanscrit name of the lilac variety, and *Ulurka* the name of the white.

Ericu. *Rheed. mal.* 2. *t.* 31. *the lilac*, and *Bel-ericu*, 31 *the white.*

Nella-jeberoo, the Telinga name of the lilac flowered variety, and Zella-jeleereo of the white flowered. *Beng.* Akunda, and Swetakund.

This is one of the most common, large, ramous shrubs over *India.* It is in flower, and has ripe seed all the year round. It grows every where, but chiefly about old walls, hedges, or ruinous places.

Stem often as thick as a man's leg, or thigh, sub-erect ramous. *Bark* ash-coloured. *Young shoots* covered with soft woolly down. *Leaves* opposite, decussate, sub-sessile, embracing the stem, broad, wedge-form, bearded on the upper side where they end in the petiole; the upper surface pretty smooth; the under one, covered with a white woolly pubescence, from four to six inches long, and from two to three broad. *Umbels* generally simple, though sometimes compound, peduncled. *Peduncles* round, covered with the same woolly substance, as the leaves and young shoots, and issuing alternately from between the opposite leaves, nearly erect, half the length of the leaves. *Involucres* several oblong, pointed scales. *Flowers* large, beautiful, a mixture of rose colour, and purple. *Calyx* five-parted. *Corol* flat. II. 31

The white flowered variety differs only from the lilac flowered, in the colour of the flowers.

A large quantity of an acrid, milky juice, flows from wounds made in every part of these shrubs; the natives apply it to various medicinal purposes; besides which, they employ the plant itself, and the preparations thereof to cure all kinds of fits; Epilepsy, Hysterics, Convulsions from Coitu immediately after bathing; also Spasmodic disorders such as the locked jaw, Convulsions in children, Paralytical complaints, Cold sweat, Poisonous bites, and venereal complaints. Good charcoal for gunpowder is said to be made of it. A fine sort of silky flax is in some parts prepared from the bark of the young shoots. A large, beautiful, inactive species of Gryllus feeds upon the leaves.

2. A. *sussuela. R.*

Succulent and smooth. *Leaves* petioled, oblong, pointed succulent smooth. *Peduncles* few-flowered. *Calyx* five-leaved. *Corols* flat, fleshy, five-lobed. *Genitalia* short, and obconical.

Corona Ariadnes. *Rumph. Amb.* 5. *t.* 182.

A native of the Moluccas and by far the largest flowering species I have yet met with; when expanded it is nearly three inches in diameter.

3. A. *acida. R.*

Page Carey Ed.

Leafless. *Umbellets* terminal simple.

Soma-lata in Sanscrit, rendered Soon by Wilkins in his translation of the *Bhagavut Geeta*, p. 80, and note 42.

Cynanchium viminale. *Willd.* 1. 1252.

Teling. Tiga-tshomoodoo.

II. 32 *Beng.* Bramee or shom-lota.

A native of hedges, forests, &c. but by no means common.

Stems twining, woody. *Branches* and *branchlets* most numerous, cylindric and smooth; particularly the youngest shoots, and they are generally pendulous when not supported; naked and succulent, like those of *Euphrobia Tirucalli*. *Leaves* scarcely the rudiments of any to be seen. *Flowers* small, pure white, fragrant, pedicelled, collected round the extremities of the branchlets, in the form of elegant, small, simple umbellets. *Calyx* small, five-parted, star-like. *Corol* flat seemingly five-petioled, as the fissures are continued close to the base. *Nectary* enlarged at the base in form of a cup, on which rests five, large fleshy, incurved, undivided, white segments. *Stamens* and *pistil*, as in the germs. *Follicles*, I never saw them.

This plant yields a larger portion of very pure milky juice than any other I know; and what is rare, it is of a mild nature, and acid taste. The native travellers often suck the tender shoots to allay their thirst.

4. A. *racemosa. R.*

Twining to a vast extent. *Leaves* round, cordate. *Genitalia* oblate. *Follicles* linear oblong, obtuse.

A native of various parts of India. Flowering time, in Bengal, the month of May.

Stems, and *old branches* woody, covered with dark, scabrous bark, twining up, and over trees of a large size; young shoots round, smooth, bright green. *Leaves* opposite, petioled, round-cordate, entire, acuminate; *Lobes* large, and rounded, smooth on both sides; some conic glands at the base, which become brown by age; length, from 3 to 6 inches and nearly as broad. *Petioles* shorter than the leaves, round, smooth. *Racemes* laterifoliate, II. peduncled, smooth, nearly erect, continuing to lengthen as the spirally disposed flowers ex- 33 pand. *Pedicles* diverging, long, round, and smooth. *Flowers* small, smooth. *Calyx* five-cleft; *segments* rounded. *Corol* perfectly rotate, most slightly contorted; segments ovate, speckled with ferruginous marks, on a pale yellow ground. *Nectarium* very short, the five exterior lamina of its five divisions obversely crescent-shaped. *Follicles* large, linear-oblong, obtuse, smooth. *Seeds* ovate, thin membrane-margined. *Coma* large. *Integument* single, a rather thick, light brown. *Perisperm* conform to the seed, thin, white. *Embryo* straight, inverse. *Cotyledons* cordate, thin, five-nerved, large and nearly dividing the perisperm into two. *Radicles* clavate, pointing to the coma, which points to the apex of the follicle.

5. A. *asthmatica. Willd.* 1. 1270.

Leaves petioled, long-cordate, downy underneath. *Umbels* axillary, compound. Calycine. *Segments* ensiform.

Beng. Unta-mool,

Teling. Kaka-palla.

This is a perennial, twining species; it is common almost every where, and delights most in a light sandy soil. It flowers during the cold season.

What is *A. alixicaca of Jacquin. See Willd.* 1. 1270? I suspect it is the same or a variety. We have one variety in the Botanic Garden at Calcutta with the young shoot peduncles and petioles tinged with red. *Root* of many, long, thick, whitish, or light ash-coloured, fleshy fibres, issuing from a small, hard, ligneous head. *Stems* several, twining, slender, round from 6 to 12 feet long; *young parts* downy. *Leaves* opposite, petioled, linear, cordate-ovate; those near the extremities are narrower, all are entire; above smooth; below downy; from two to three inches long. *Petioles* about half an inch long, channelled. *Umbels* II. solitary, axillary, and alternate, generally compound. *Peduncles*, and *pedicels* twice the 34 length of the petioles, round, downy. *Involucres* lanceolate. *Flowers* numerous, small, colour a mixture of bad yellow, and orange. *Calyx; divisions* lanceolate, very acute. *Corol* flat; *divisions* oval. *Follicles* lanceolate, spreading, three or four inches long, and about two in circumference.

On the coast of Coromandel, the roots of this plant have often been used as a substitute for Ipecacuana. I have often prescribed it myself, and always found it answer as well as I could expect Ipecacuana to do; I have also often had very favorable reports of its effects from others. It was a very useful medicine with our Europeans who were unfortunately prisoners with Hyder Ally, during the war of 1780, 81, 82 and 83. In a pretty large dose, it answered as an Emetic; in smaller doses, often repeated, as a Cathartic, and in both ways very effectually.

I had made and noted down many observations on its uses, when in large practice in the General Hospital at Madras in 1776, 77 and 78, but lost them, with all my other papers, by the storm and inundation at and near Coringa in May 1787. I cannot therefore be so full on the virtues of this valuable, though much neglected root, as I could wish. I have no doubt but it would answer every purpose of Ipecacuana.

The natives also employ it as an Emetic; the bark of about three or four inches of the fresh root, they rub upon a stone, and mix with a little water for a dose; it generally purges at the same time.

Note by Dr. P. Russell.

"Dr. Russell was informed by the Physician General at Madras, (Dr. J. Anderson,)

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that he had many years before known it used, both by the European and Native Troops with great success in the dysentery which happened at that time to be epidemic in the camp. The store of Ipecacuana had it seems, been wholly expended, and Dr. Anderson finding the practice of the black doctors much more successful than his own, acknowledged, with his usual candour, that he was not ashamed to take instruction from them, which he pursued with good success; and collecting a quantity of the plant which they pointed out to him, he sent a large package of the roots to Madras. It is certainly an article of the Hindoo materia medica highly deserving attention.

6. A. *tunicata, R.*

Leaves long-cordate, smooth. *Stipules* short-petioled. broad-cordate. *Umbels* simple. *Nectary* double.

Periploca tunicata. Willd. 1. 1252. *Retz.* 3. *obs.* 2. *N.* 35. *Hind.* Kallia-luta.

Beng. Chagul-pati.

A pretty large, twining shrub, a native of the hedges, &c. Flowering time, the rainy season. Its milky juice is particularly gummy.

Leaves opposite, petioled, cordate, with large, rounded, posterior lobes; pointed, entire, both sides smooth; from 2 to 4 inches long. *Petioles* half the length of the leaves, stem-clasping. *Stipules* two in the same axil, none in the other opposite one; they are short-petioled, broad-cordate, pointed, smooth, about an inch long each way. *Umbels* solitary, small, simple, few-flowered, occupying the axil opposite to the stipules. *Flowers* small, rusty colour. Corol flat. *Nectary* double. *Exterior* tubular, gibbous, considerably large, and completely embracing the inner, and the fructification; towards the apex plaited, and contracted; *mouth* ten-toothed, the alternate ones very large, and emarginate. *Interior* as in the genus. *Follicles* lanceolar, flat on the inside, with sharp margins, black, deeply and irregularly furrowed.

7. A. *microphylla, R.* II. 36

Leaves cordate, with a minute point, smooth and fleshy. *Racemes* lateral, few-flowered, scaly with branches.

Parparam. *Rheed. mal.* 9. *t.* 17.

Teling. Poola-palla.

A long, small, delicate twining perennial, a native of hedges, &c. Flowering time, the wet season. It is probably *Cynanchium parviflorum* of the *Banksian herbarium.*

Leaves opposite, petioled, cordate, with a minute acute point, smooth, shining, entire, fleshy; from half an inch, to an inch long. *Racemes* lateral, sessile, small, few-flowered. *Bractes* lanceolate. *Flowers* small, stellate, long-pedicelled, many of them without stamens, or pistil. *Corol* flat. *Follicles* as in the last two species, but smaller.

8. A. *volubilis. Willd.* 1269.

Leaves petioled, broad-ovate, pointed, smooth. *Fructification* with nectary, turbinate, and truncate. *Umbels* simple.

Watta-kakacodi. *Rheed. mal.* 9. *t.* 15.

Teling. Doodee-palla.

Beng. Tita-kunga.

A large woody, twining species; common in hedges, thickets, &c. Flowering time, the wet season. *Bark* of the woody parts smooth, ash-coloured.

Leaves opposite, petioled, broad-cordate, but not sinuate at the base, pointed, entire, smooth; from 3 to 4 inches long. *Petioles* from 1 to 2 inches long. *Umbels* lateral, or axillary, simple, many flowered. Flowers numerous, green, with pedicels as long as the peduncle. *Corol* flat. *Nectary* turbinate, truncate. *Anthers* reflected over the common stigma. *Follicles* horizontal, obtuse, about three or four inches long, and four in circumference.

9. A. *pendula, R.* II. 37

Leaves oblong, veinless, very smooth, and fleshy. *Umbels* simple, many flowered. *Nectaries* protruding five horns at the base.

Nansjera-patsja. *Rheed. mal.* 9. *t.* 13.

A native of the mountainous parts of the Circars; it flowers during the hot and rainy seasons.

Stems and larger *branches* woody, twining, running over trees, &c. to a great extent. *Branchlets* twiggy, and pendulous. *Leaves* opposite, oblong, smooth, shining, of a very firm, hard, fleshy texture, veinless. *Umbels* peduncled, lateral, solitary, pendulous with the branchlets many flowered. *Flowers* milk-white, fragrant, pendulous also. *Pedicels* as long as the peduncles. *Corol* flat, inside covered with a kind of silky down. *Nectary* stellate; O may represent one of its five parts much magnified. *Anthers* remarkably large, reflected over, and resting upon the *common stigma.* If taken out and examined before the flower opens, they are then found much swelled; along the sharp edge there is a double line, which I conceive to form an opening for the prolific fluid to escape at, but in old flowers they are mere collapsed membranes. On dividing the plump ones I could readily press out a yellow fluid.

Note. This is the most favorable species I have met with for examining the structure, and contents of the *anthers* of this *Gynadrous* genus.

10. A. *annularia, R.*

Leaves petioled, cordate, pointed, smooth; *nerves* and *veins* red; *genitalia* sitting on a large annular receptacle.

Ada-kodien. *Rheed. mal.* 9. *t.* 7.

Teling. Palla gurgi.

It is a native of moist vallies. Flowering time, the wet season.

Stem twining, perennial. *Young shoots* round, and very smooth. *Leaves* opposite,

II. 38 petioled, cordate, deeply lobed at the base, pointed, entire, smooth on both sides, nerve and veins red; on the upper side near the base are some small bristly points; from three to five inches long, and two or three broad. *Petioles* about two inches long. *Umbels* lateral, peduncled, simple, few-flowered. *Flowers* large, the colour a beautiful mixture of red, green and white. *Calyx* five-leaved; *leaflets* ovate. *Corol* flat. *Nectary*, its base forms a large, fleshy, somewhat five-sided ring. *Filaments* twisted. *Anthers* very long, they hang down on the sides of the *common stigma*, which is here very large, of an oval form, composed of five lobes, with a pentagonal crown.

11. A. *suberosa, R.*

Bark of the woody parts suberose. *Leaves* petioled, cordate, downy. *Umbels* simple. *Corols* downy. *Fructification* globular. *Anthers* hornletted.

Cynanchium *reticulatum. Willd.* 1. 1258.

A large, twining, perennial species common in hedges, &c. over most parts of the coast of Coromandel. It flowers during the latter parts of the rains, and the cold season.

Stem, and old *branches* woody, twining; *bark* light ash-coloured, suberous, and cracking deep in various directions; *young parts* slightly downy. *Leaves* opposite, petioled, oblong, cordate, entire, acute, downy, particularly when young; two or three inches long, and one and a half or two inches broad. *Petioles* round, one half length of the petioles. *Umbels* lateral, simple, peduncled, about the length of the petioles. *Flower* numerous, small, star-form, greenish-yellow, scentless. *Corol; tube* scarcely any; *segments* of the border spreading; *margins* revolute, downy. *Nectarial* sheath surrounding the fructification, as in the genus, the whole small, and globular. *Anthers* oval, horned, bent up over the common
II. stigma.

39 12. A. *pseudosarsa, R.*

Shrubby, twining, filiform. *Leaves* from ovate to linear, smooth, shining. *Spikes* axillary, sessile, imbricate. *Follicles* linear.

Ceropegia *tenuifolia, Linn. Mant.* 346.

Periploca *indica. Willd.* 1. 1251. when broad leaved.

Periploca *emetica*, the wild one. 1251. *Retz. obs.* 2. No. 34. when narrow leaved.

Naru-nindi. *Rheed. mal.* 10. t. 34. very good.

Ununta-mool of the Hindoos when the leaves are broad, and Sada-boari when narrow.

Palla-soucandee is the Telinga name for the narrow leaved parts, and Ghodie soucandee for the broad leaved.

It is one of the most common, twining shrubs on the Coast, Bengal, &c. grows equally well in every uncultivated soil, and in all situations. Flowers during the wet season.

Root long, and slender with few ramifications, covered with rust coloured bark, which possesses a peculiarly pleasant sort of fragrance, whether fresh or dried. *Stems* twining, diffuse, or climbing, woody, slender, generally from the thickness of a goose quill, to that of a crow quill, pretty smooth. *Leaves* opposite, short petioled, shape very various; on the young shoots that issue from old roots, and lie on the earth they are linear, acute, and striated down the middle with white; on the superior, and old branches, they are generally broad-lanceolate, even, sometimes ovate or oval; all are entire, smooth, shining, and of a firm texture, the length and breadth very various. *Stipules* four-fold, small, on each side of each petiole, caducous. *Racemes* axillary, sessile, imbricated with flowers, and then with scales like bractes. *Flowers* small; outside green, inside a deep purple. *Calyx* divisions acute. *Corol* flat; *divisions* oblong, pointed, inside rugose. *Nectary, stamens*, and *pistil* as
II. in *Asclepias*. *Follicles* long, slender, spreading.

40 The Hindoos make two species of this plant on account of the variety of the leaves; and I long thought they were so, till searching more narrowly, and taking up many of the roots. I then frequently found every variety of the leaves on different branches, issuing from the same root; which confirmed me in their being one plant. This is probably what Retz calls name *P.* Emetica but I am pretty clear Dr. König did not give it that name. To the best of my remembrance, he always conceived the broad leaved to be *P.* Indica, and the narrow to be *Ceropegia tenuifolia*. The plant sometimes employed as a substitute for *Ipecacuana*, is what König described under the name *Asclepias vomitoria;* a drawing and description of it will be found in my collections, viz. N. 608. *Asclepias asthmatica*. The roots, whether dried or fresh, have a pleasant, peculiar fragrance, which I cannot describe. They are known on the Coromandel coast by the name of country *Sarsaparilla;* and as such were often employed by our Medical Gentlemen. The natives employ them in medicine more than we do, particularly for the thrush in children. For this disorder the dried bark is reduced to a fine powder, and fried in butter; the proportion uncertain, as is often the case with Hindoo prescriptions, the quantities being in general guessed; about a drachm of this is given, night and morning. They are also employed, with some other roots in the cure of *venereal* complaints.

13. A. *rosea, R.*

Leaves linear, smooth. *Racemes* longer than the leaves. *Corols* fringed with hairs. *Follicles* inflated.

Periploca *esculenta, Will.* 1. 1250. *R. Corom. pl.* 1. *N.* 11.

Periploca *esculenta* of König. See Suppl. plant. 168.

Dooghdika, (or milk plant;) is its Sanscrit name. *See* Asiatic Researches, 4. 268.

II. *Beng.* Kirui, Doodhee, Doodh-luta.

41 *Teling.* Doodee-palla.

It is a twining perennial; growing in hedges, and amongst bushes on the banks of water

courses, pools, &c. *Leaves* deciduous during the dry season. In flower and foliage during the rainy season. Page Carey Ed.

Root of filiform fibres. *Stem* and *branches* numerous, twining, round, smooth, running over bushes of considerable size. *Leaves* opposite, spreading, short petioled, linear, tapering to a fine point, round at the base, entire, smooth, from four to six inches long, and about three eighths of an inch broad. *Racemes* lateral, long, few-flowered. *Flowers* large, beautiful, white, with a small tinge of rose-colour, and striated with purple veins, inodorous. *Nectary* and *Stamens* as in the genus. *Follicles* oblong, inflated.

On this Coast I do not find the natives ever eat it, or apply it to any purpose whatever; cattle however eat it. Its elegant flowers render it well deserving of a place in the flower Garden. Every part abounds with milk, hence its names in various Asiatic languages.

14. A. *tenuissima. R.*

Filiform, smooth. *Leaves* linear-lanceolate. *Umbels* proliferous. *Genitalia* a truncated cone.

A native of Bengal.

Stem perennial, simple, of several yards in length, very smooth, about as thick as a pack thread. *Leaves* opposite, short-petioled, linear-lanceolate, base rather broad, and somewhat cordate, entire, plain, smooth on both sides; almost veinless; length from one to two inches, and a litte more than a quarter of an inch broad. *Petioles* nearly round, about as long as the leaves are broad. *Umbels* solitary, from between the insertion of each pair of leaves, proliferous. *Peduncles* diverging, round, smooth, filiform. *Flowers* small, of a dull purple colour. *Calyx* smooth, deeply cut into five, narrow, acute divisions. *Corol* rotate; *divisions* ovate, oblong, obtuse. II. 42

15. A. *parasitica. R.*

Parasitic, perennial, creeping. *Leaves* ovate-lanceolate, fleshy, drooping. *Umbels* simple, globular; *nectary* concave, stellate, protruding five ovate rays at the top.

This charming species is a native of the Sunderbund, or forest in the æstuary of the Ganges, where it grows on trees, creeping up, and over their trunks and branches to an extent of some fathoms; emitting roots from every part, which take fast hold of the parent tree. The first plant brought into the Botanic garden at Calcutta died when planted in the ground; but when tied to trees and their roots fixed in any cavity or fork where some humidity and nourishment was to be found, they grew well, though slowly, and blossomed during the hot season, and about the beginning of the rains in June. I have, however, reared them in common earth since.

Leaves opposite, petioled, retrofracted, ovate-lanceolate, acute, of a firm fleshy texture, and smooth on both sides; veins scarcely conspicuous above, and invisible underneath; from two to four inches long, and about one broad. *Petioles* short, round, ash-coloured, in fact, more like a part of a branch than a petiole. *Peduncles* solitary, interfoliaceous, round, smooth, about an inch and a half long, each supporting a most elegant, drooping, globular umbel, of the most beautiful, exquisitely fragrant, rather small, pearl-coloured flowers. *Calyx; leaflets* linear, scarcely half the length of the corol. *Corol* wheel-shaped, with the divisions cordate. *Nectary* concave, stellate, protruding five ovate, thick fleshy horns, or rays at the top. *Stamens* as in the genus. The pericarp has not yet been found.

Section 2nd. Corols Salver-shaped. II. 43

16. A. *tinctoria. R.*

Leaves petioled, long-cordate. *Thyrses* axillary, solitary, glomerate; *mouth* of the *Corol* hairy. *Fructification* oblong.

Faroom-akkar. Marsden's history of Sumatra, page 78.

The natives of the coast of Coromandel have no name for it, the plant being foreign to them.

The following description, and the accompanying drawings were taken from plants raised in my Garden at *Samulcota*, the original of which Colonel Kyd sent me from the Company's Botanical Garden at Calcutta. With me it is a large twining shrub and has flowered during the hot and rainy seasons. It is quickly and easily propagated by layers, and cuttings. I have not seen the pericarp.

Stem and *branches* twining, round. *Bark* of the woody parts ash-coloured; that of the young parts a little downy. *Leaves* opposite, petioled, horizontal, or rather reclining, cordate, or oblong-cordate, obtuse-pointed, a little downy, somewhat bubbled, waved; from four to nine inches long, and from two to six broad. There are some small subulate glands on the upper side close to the base; these while young yield a waxy substance. *Petioles* round, from one to two inches long. *Stipules* none. *Thyrses* solitary, between the leaves, peduncled: as they become old glomerate, from their increasing length. *Flowers* very numerous, pedicelled, very small, yellow. *Bractes* minute. *Calyx* five-leaved; *leaflets* oblong, downy. *Corol* funnel-formed, *tube* short, gibbous; *mouth* nearly shut up with long silver-coloured hairs. *Border* horizontal. *Nectary*, &c. agree well with the general character of the genus.

The leaves of this plant yield Indigo, as mentioned by Mr. Marsden, and by Mr. Blake, in the first volume of the Asiatic Researches. I have also extracted it from them by hot water. The few experiments I have yet made, do not enable me to say positively in what proportion they yield their colour; but it was of an excellent quality, and as the plant grows very readily from layers, slips, or cuttings, I think it very well worthy of being cultivated; particularly as it is permanent, like the *Nerium*, so that a plantation once formed, will con- II. 44

Page Carey Ed. tinue for a number of years; and if we are allowed to draw a comparison between the leaves of this plant, and those of *Nerium tinctorium*, the quantity of colour they may yield will be in a larger proportion than from the common *Indigo* plant.

Since writing the above I have learned that this plant is a native of Cooch-bahar and I had some of the plants sent me from thence, also from Pegu, from whence I have likewise received plants.

Some more experiments I have made with the leaves, comfirm what is above related, not only respecting the quality of the Indigo, but also that the proportion is considerably greater than is obtained from *Indigofera tinctoria*. I have therefore warmly recommended an extensive cultivation thereof.

17. A. *echinata. R.*

Hairy. *Leaves* long-petioled, round-cordate, pointed, downy. *Umbels* proliferous, long-peduncled. *Follicles* covered with inoffensive prickles. *Fructification* clavate.

Cynanchium *extensum. Willd.* 1. 1257.

Pergularia. *Lamarck's illust. t.* 176.

Hind. Sagowani.

Teling. Jutuga.

This is also a perennial, twining species, a native of hedges, &c. flowering time the wet, and cold season; it abounds with milky juice. Tender parts hairy. The smell offensive.

II. 45 *Leaves* opposite, petioled, broad-cordate, with a deep sinuosity at the base; and semi-orbicular lobes; entire, pointed, very downy, from two to three inches long. *Petioles* nearly as long as the leaves. *Umbels* lateral, long-peduncled, sub-erect, often compound, many-flowered. *Involucres* few and minute. *Flowers* middle sized, of a dirty whitish colour, long-pedicelled, very fetid. *Corol* tubular; *tube* not quite half the length of the nectary; *apexes* of the five divisions long, very acute, and spirally incurved over the common stigma. *Anthers* spreading obliquely under the margins of the common stigma. *Follicles* hedge-hogged.

18. A. *geminata. R.*

Leaves ovate, downy. *Umbels* simple in pairs from alternate axils. *Nectary* a simple, five-toothed tube; common stigma sub-globular.

Beng. Choota-doodee-luta.

This is also a large twining woody plant; a native of hedges. Flowering time the same as that of the last species. *Leaves* opposite, short-petioled, ovate, pointed; at the base a little cordate, entire, downy, from two to three inches long. *Umbels* lateral, simple, globular, paired, short-peduncled, the whole being little more than the length of the petioles. *Flowers* numerous, small, yellow, with the globular apex of the white common stigma projecting in the centre; it looks like a fine pearl set in gold. *Calyx* five-leaved. *Corol;* tubular, downy; on the inside of the tube are five elevated ridges; *divisions* of the border spreading, triangular, acute. *Nectarial* sheath very simple, its apex reaches very little above the base of the common stigma, and is five-toothed. *Anthers* erect, affixed round the base of the common stigma, which is large, obovate, and two-thirds above the nectary.

19. A. *montana, R.*

Leaves oblong, pointed, smooth. *Umbels* lateral, solitary, proliferous. *Common stigma*

II. 46 globular.

This is another large, woody, twining plant; a native of mountainous tracts.

Leaves opposite, petioled, oblong, pointed, entire, smooth on both sides; about five inches long. *Umbels* solitary, lateral, compound, longer than the petioles. *Involucres* lanceolate. *Flowers* numerous, middle sized, whitish. *Calyx* five-parted. *Corol* tubular; *tube* five-sided; on the inside are five pair of elevated, hairy ridges; *divisions* of the border linear. *Nectary, stamens*, and *stigma*, as in A. *geminata.*

20. A. *longistigma. R.*

Leaves oblong. *Panicles* axillary, dichotomous; *divisions* of the corols linear; *common stigma* sub-lanceolate; and elevated above the nectary. *Stem* twining, woody, smooth; *young shoots* covered with dark rust-coloured down. *Leaves* opposite, petioled, oval, waved, pointed, of a smooth, shining, firm texture; when very young covered with the same rusty down. *Petioles* short, generally crooked, covered with rust-coloured hairs. *Panicles* axillary, solitary, dichotomous, much shorter than the leaves. *Flowers* yellow, fragrant. *Corol* tubular; *divisions* of the border linear, a little twisted. *Stigma common*, green, oblong, pointed, elevated high above the nectary, only its base where the anthers are attached, is enveloped by the apex of the nectary.

21. A. *odorotissima. R.*

Bark of the woody parts suberose. *Leaves* cordate, soft, though not downy. *Nectary* and organs of fructification shorter than the tube of the corol, which is woolly within. *Stigma* subglobular.

Pergularia odoratissima. Smith's coloured figures of rare plants; fasc. 3. N. 16.

II. Pergularia *Minor B. M. N.* 755.

47 Flos Siamicus. *Rumph. Amb.* 7. *t.* 26. *f.* 1.

Mal. Tonki, or Tonkin.

Cynanchium *odoratissimum. Lour. Cochin Ch.* 164.

Beng. Kunja-luta.

The Telingas have no name for it.

Eng. West coast creeper.

This plant is said to have been originally introduced into our gardens from Sumatra, where it continues to be carefully cultivated; hence its English name, the West side of that

Island on which we have our settlements, being generally called in India, amongst the English, the West coast. Page Carey Ed.

For my part I cannot well consider this plant as a species of *Pergularia*; it seems to unite the character of this genus with that of *Asclepias*. The nectary which I believe is the most essential part, is that of the latter; and the corol that of the former. At all events I consider it as a perfectly distinct species from P. *tomentosa*; on account therefore of the exquisite fragrance of its flowers, I call it *odoratissima*. It is in flower from the beginning of the hot, till near the end of the wet season. The *Root* consists of many, horizontal, crooked, ramifications, covered with thick spongy bark.

Stems twining, woody. *Bark* deeply cracked, and corky on the old parts; smooth, ash-coloured on the younger, jointed; where the joints rest on the ground they strike root; young, tender shoots slightly downy. *Leaves* opposite, petioled, cordate, waved, sharp-pointed, entire; when young a little downy, about four inches long, and three broad. *Petioles* round, about an inch long. *Umbels* axillary, solitary, alternate, shorter than the leaves, many-flowered. *Bractes* lanceolate, *Flowers* middle-sized, yellow, or orange coloured, exceedingly fragrant. *Calyx* five cleft; *divisions* waved, permanent. *Corol; tube* gibbous, longer than the calyx; inside covered with soft down. *Border* spreading; *divisions* obliquely-ovate, above convex. *Nectary*, five bodies surrounding the pistillum, firmly united at the base but tapering from thence upwards into a sharp point. A single one detached, and viewed side ways, is seen to be split more than half way down, and the exterior lamina is again half two cleft; the *interior* is concave, pressing upon the anthers, (yellow scales,) and receives from them a coloured impression. *Stamens* as in the genus. *Germs* two, ovate. *Styles* scarcely any; *common stigma* turbinate, round the upper part of which the five pair of yellow *anthers* are fixed to its five minute, dark brown, hairy angles. *Follicles* two, large, oblong, tapering to a point. *Seeds* numerous, imbricate, ovate, compressed, surrounded with a membranaceous wing, and crowned with a long coma. *Receptacle* cylindric, spongy, free. II. 48

22. A. *pallida*. *R.*

Leaves long-cordate, smooth. *Umbels* short-peduncled, simple or compound; *tube* of the corol gibbous, length of the oval genitalia; segments of the border linear. *Follicles* smooth, lanceolate.

A native of various parts of India. Flowering time, the rainy season. It has a great resemblance to Vahl's *Pergularia purpurea*. The flowers are pale yellow, and not fragrant, or in a very small degree.

Stems ligneous, perennial, twining up and over trees of considerable size. *Young shoots* round, slender, and clothed with small, soft recurved hairs. *Leaves* opposite, petioled, long-cordate, entire, acute, smooth, but soft; three or four inches long, and less than one and a half, or two broad. *Petioles* an inch long, slender, villous, and slightly channelled. *Umbels* between the leaves, (laterifolius,) very short-peduncled, often compound. *Pedicels* longer than the peduncles, villous. *Bractes* ensiform, one under the insertion of each pedicel. *Flowers* numerous, drooping, pale yellow, inodorous. *Calyx* five parted, shorter than the tube of the corol. *Corol; tube* gibbous, outwardly rugose, otherwise smooth, particularly within. *Border* of five, obliquely linear-oblong, revolute margined, spreading segments, which are at least twice the length of the tube. Their length and narrowness, and want of fragrance are the most obvious marks by which to distinguish this species from A. *odoratissima*. II. 49

Genitalia oval, just the length of the tube of the corol. *Common stigma* oblong, and almost entirely hid by the inner lamina of the nectary. *Follicles* lanceolate, smooth.

23. A. *laurifolia*. *R.*

Twining. *Leaves* petioled, oblong, polished. *Panicles* axillary, round, crowded. *Corols* subrotate; *genitalia* round-oval. *Follicles* slender, diverging horizontally.

A native of Chittagong, Tippera and the mountainous countries east of Bengal. Flowering time in the Botanic garden at Calcutta, the rainy season; the seeds are ripe in March.

Stem and *branches* shrubby, twining to a great extent. *Bark* brown, and every part replete with a milky juice which exudes from fresh wounds. *Leaves* opposite, petioled, oblong, entire, some obtusely cuspidate, some emarginate, of a firm, somewhat fleshy texture, polished on both sides; a range of dark coloured points where joined to the petiole; length from two to six inches, and one or two broad. *Petioles* one-fourth the length of the leaves round and smooth. *Panicles* laterifolius, solitary, globular, crowded, much shorter than the leaves. *Peduncles* about as long as the petioles, round, villous, with short, ferruginous hairs. *Pedicels* shorter but similar. *Bractes* minute, triangular. *Flowers* numerous, very small, pale yellow. *Calyx* five-toothed. *Corol* sub-rotate; *divisions* of the border obliquely-oblong, hairy on the inside; their margins meet only, and are not contorted as in most species of this natural order. II. 50

Column of fructification, including the nectarium, scarcely differing from the other *Asclepiadiæ* will not therefore require to be particularized. *Follicles* slender, diverging horizontally, round, about as thick as a goose quill where thickest, and about five inches long, obtuse, dotted with small, scabrous specks, otherwise smooth, and brown. *Seeds* cuneiform. *Tuft* or *coma* very long, delicately fine, and white. *Integument* single, smooth, brown, adhering firmly to the perisperm which is in small quantity, and pale coloured. *Embryo* straight, inverse. *Cotyledons* linear-oblong. *Radicle* cylindric, pointing to the coma or tuft.

24. A. *micrantha*. *R.*

Twining smooth. *Leaves* petioled, oval, rather obtuse, long, acuminate, tumid. *Pani-*

Page Carey Ed. *cles* sub-axillary, globular; *corols* companulate, stellate, villous. *Genitalia* sub-globular. A large, perennial, twining, delicate plant, a native of *Hindoostan*, from the vicinity of Cawnpore. Colonel Hardwicke sent it to the Botanic Garden at Calcutta, where it blossoms during the rains.

25. A. *herbacea. R.*

Herbaceous, erect. *Leaves* petioled, oblong. *Umbels* compound. *Corols* with globular tube, which enclose the genitalia.

This is probably Sir William Jones's *Padmarka*, see Asiatic Researches. vol. 4. page 267. It is a native of the interior parts of Bengal, and was introduced into this garden by Dr. William Carey.

Root perennial, ligneous. *Stems* herbaceous, straight, with scarcely any *branches. Bark* of the oldest parts, light ash-colour, of the young shoots green. *Leaves* opposite, petioled, II. 51 oblong, entire, smooth on both sides, pale green, underneath more so; there are four or five minute bristly glands on the upper surface of the middle nerve near the base. *Petioles* about an inch long, channelled, smooth. *Umbels* between the leaves, compound, peduncled. *Peduncle* short, round, smooth. *Pedicels* twice as long as the peduncles, one-flowered. *Bractes* subulate, mixed amongst the insertions of the pedicels. *Flowers* numerous, large, colour a most beautiful mixture of purple, red-purple and white. *Calyx* five-leaved; *leaflets* linear, acute, scarcely half the length of the corol. *Corol; tube* globular. *Segments* of the border three-angular, (not contorted.) *Nectarium* as in *Asclepias gigantea*, but shorter. Indeed the whole plant comes so exceedingly near that beautiful species, that by a common observer it may be taken for the same, though very different, particularly in having petioled leaves, and a globular tube the corol. *Follicles* two; but I have not seen any that were full grown.

Like *Asclepias gigantea*, and most other plants of the same order, every part is replete with much acrid, milky juice.

26. *A. tenacissima. R.*

Leaves long-petioled, exactly-cordate, fine-pointed, villous. *Panicles* drooping. *Genitalia* obovate. *Follicles* ovate-oblong, obtuse, tomentose.

This plant is a native of the mountains near Rajemahl, and the fibres of its bark are employed by the inhabitants to make their bow strings.

This elegant, and very useful species was first taken notice of in 1800 by Mr. W. Roxburgh, junior, growing wild on the above mentioned hills, and by him introduced into the Botanic Garden at Calcutta, where the plants thrive luxuriantly, blossom in April, and ripen their seed about ten months afterwards.

II. 52 *Stem* perennial, twining over trees, &c. to a very great extent, and in general about as thick as a large ratan. *Branches* few, *young shoots* downy. From wounds there exudes a milky juice, which thickens into an elastic substance, very like *Caoutchouc* and rubs out blacklead pencil lines as readily as that does, and I think may be reckoned an additional species of it. *Leaves* opposite, the pairs in luxuriant shoots (fit for flax,) very remote, petioled, exactly cordate, acute-pointed, entire, very soft, with much fine down on both sides; general length from four to six inches, and from three to four broad. *Petioles* round, downy, from two to four inches long. *Panicles* interfoliaceous, large, drooping, composed of alternate, drooping branches, of numerous, small umbellets, of beautiful greenish yellow flowers. *Bractes* minute, two or three under the insertion of the fascicles of flowers which compose the umbellets. *Calyx* deeply five-cleft; *divisions* rather more than half the length of the tube of the corol, and downy on the outside. *Corol* salver-shaped. *Divisions* of the border obliquely oval, with apices rounded, greenish toward the centre, with the exterior half yellow. *Column* of *fructification* short-clavate, about as long as the tube of the corol, with the white apex of the common stigma naked. *Follicles* ovate-lanceolate, obtuse, nearly round, with a groove on the inside, clothed with much soft, velvet-like green down; about six inches long, and from four to five in circumference where thickest. *Seeds* numerous, obovate, thin, with a broad membranaceous margin, and long soft silky pappus.

The bark of the young luxuriant shoots yields a large portion of beautiful fine silky fibres, with which the mountaineers of Rajemahl make their bow strings, on account of their great strength, and durability.

During the rains, they cut the shoots into lengths at the insertion of the leaves, peel off the bark, and with their nails, or a bit of stick on a board, remove the pulpy part. A person II. accustomed to this work, will, I am told, clean as much as six pounds of the fibres in one day. 53 These fibres, and those of the bark of the Malay plant *Battang-callooee*, or *poolas (Urtica tenacissima. R.)* are by far the strongest fibres which I have met with in the vegetable kingdom, far exceeding those of the leaves of my *Sanseviera Zeylanica*. A line made of common hemp, for a standard, broke with 158 pounds when dry, and 190 when wet; the average of several trials. A similar line of this substance broke with 248 when dry, and 343 when wet, while one of *Battang-callooee* broke with 240 when dry, and 278 when wet.

27. A. *tingens. Buch.*

Leaves cordate. *Racemes* spiral, sub-axillary. *Fructifications* cochleari-cylindric. *Stigma* oval, crowning the tube of the corol.

A large, twining, shrubby plant, brought from Pegue to the Botanic Garden at Calcutta, by Dr. Buchanan. Flowering time the rainy season; seed ripe the May following.

Stem twining, woody, with numerous, twining, smooth branches, extending far over whatever supporters they meet with. *Bark* pretty smooth, when young brownish; when old, ash-coloured. *Leaves* opposite, petioled, cordate, entire, pointed, smooth on both sides, from three to six inches long, and from two to four broad. *Petioles* about an inch long, channelled,

smooth. *Umbels* sub-axillary, short-peduncled, compound. When they begin to blossom, the inflorescence is a perfect umbel, but becomes a long, shining, spiral raceme. *Pedicels* rather longer than the peduncles, one-flowered, smooth, diverging in all directions. *Flowers* numerous, pale yellow or cream colour when they first expand, but grow gradually darker. *Calyx* to the base five-cleft. *Corol; tube* as long as the fructification; on the inside run five double ridges, which are ciliated with short brown hairs. *Border* expanding; *divisions* obliquely oval. *Nectary* as in the genus, with the cordate divisions of its mouth covering the stamina, and lower part of the stigma. *Stamina; receptacles* affixed to the base of the stigma. *Anthers* nearly erect. *Style* single. *Stigma* globular, smooth, pearl-coloured, half hid in the mouth of the tube, round its underside ten pits are found, corresponding with the ten anthers. *Follicles* ovate-lanceolate, spreading, smooth, and fleshy, length about four inches, and one in diameter where thickest. Page Carey Ed. II. 54

Dr. Buchanan informed me that from the leaves of this plant, the Burman people prepare a green dye. It is probable that those people forgot to inform the Doctor that it was necessary to dye the cloth yellow, either before or after the application of the colour prepared from the leaves of this plant; in which case it will be the second species of *Asclepias* described, and figured by me, which yields Indigo; though, for my own part, I have not succeeded in procuring that material from the leaves.

28. A. *pulchella. R.*

Shrubby, twining. *Leaves* long-petioled, round-cordate acuminate, smooth. *Racemes* long-peduncled; *genitalia* subcylindric, with the five exterior *lamina* of the nectary long, and subulate; converging into an open dome high over the common stigma.

Ada-kodien. Rheed. mal. 9. *t.* 7. would be a tolerably good representation of this elegant plant, if the fascicles of flowers were long-peduncled.

It is an extensive, perennial, twining species, a native of the forests of Silhet, where it is called *Kulum*. Flowering time, the rainy season.

Stems and *branches* twining; young shoots perfectly smooth and deep green. *Leaves* opposite, long-petioled, cordate, entire, smooth, acuminate, from four to eight inches long, and from three to six broad. *Racemes* very long-peduncled, sometimes proliferous; by age the rachis lengthens into the form of a short raceme. *Flowers* very large, pure white; long-peduncled. *Calyx* five-parted, smooth. *Corol* five-parted rotate; *segments* oblong, in the bud imbricated. *Nectary* subcylindric; *exterior lamina* membranaceous, ensiform, ending in long, fine, acute points, which converge over the stigma, their texture horny and polished; in their retuse tops, are the pits where the anthers are lodged. *Germs* two. *Style* short; *common stigma* five-angled; to the points of the angles the five-ovate, hard, polished, chesnut-coloured bodies are attached, which give substantial support to the five pairs of large, oval anthers, by means of their thick, short, polished chesnut-coloured, cyathiform pedicels. II. 55

29. A. *acuminata. R.*

Ligneous parts with suberous bark. *Leaves* ovate-oblong, acuminate, above polished, villous underneath. *Umbels* paired in the alternate axils, sub-globular, crowded. *Mouth* of the *corol* with five incurved glands.

A large scandent, and twining perennial, with the bark of the trunk, and old woody parts particularly spongy, and deeply split. The young *shoots* villous. *Umbellets*, in pairs, sub-axillary, and never in opposite axils; crowded with small, white, short-pedicelled flowers. It is a native of the forests of Chittagong, and from thence was introduced into the Botanic Garden at Calcutta, where it blossoms about the beginning of the rainy season.

MELODINUS. Schreb. gen. n. 425.

Calyx five-parted. *Corol* infundibuliform; mouth crowned with five simple, or divided scales. *Germ* superior, two-celled; *ovula* numerous, attached to the thick, elevated centre of the partition. *Berry* two-celled, *seeds* numerous, immersed in pulp. *Embryo* furnished with a perisperm; *radicle* centripetal.

1. M. *monogynus. R.* II. 56

Shrubby, scandent. *Leaves* opposite, lanceolate, glancing, acuminate. *Panicles* axillary, and terminal, sub-globular, crowded, brachiate. *Nectarial scales* five, undivided.

Sadul kou is the vernacular name in Silhet, where it is found indigenous in the forests, climbing over trees, &c. Flowering time the month of April. Seed ripe in October and November. It is eaten by the natives; the taste of the firm pulp in which the seeds are immersed is sweet and agreeable to the taste.

Young shoots round, and smooth, lactescent. *Leaves* opposite, short-petioled, lanceolate, shining, entire, acuminate, from three to six inches long and one or two broad. *Stipules* none. *Panicles* terminal, and from the *exterior* axils, subglobular, brachiate; extreme divisions three-flowered. *Bractes* oblong, acuminate. *Flowers* pretty large, white and fragrant. *Calyx* of five, smooth, oval, permanent leaflets. *Corol* infundibuliform; *segments* of the border five, subfalcate. Mouth of the tube crowned with five, undivided, woolly, ensiform scales. *Filaments* five, short, inserted into the tube of the corol near the base. *Anthers* sagittate, lodged rather below the middle of the tube, opening on the sides below the apex. *Germ* superior, two-celled, with many *ovula* in each, attached to elevated receptacles on the middle of the partition. *Style* short, and undivided. *Stigma* clammy, subovate, embraced by the anthers, apex slender, and bifid. *Berries* of a round, somewhat four-cornered shape, size and appearance of a small, deep-coloured, very smooth orange; two celled. The whole very inviting to the eye. The firm pulp in which the seeds are immersed is palatable, and is eaten by the natives

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where the plants grow. *Seeds* numerous, long, ovate, considerably compressed, size of a cucumber seed. *Integument* besides the pulp of the berry two; exterior rugose, thick, dark brown; interior membranaceous. *Perisperm* conform with the seed. *Embryo* straight. *Cotyledons* oval. *Radicles* cylindric, centripetal.

WILLUGHBEIA. Schreb. pen. n. 417.

Calyx five-toothed. *Corol* hypocrateriform. *Stigma* capitate. *Germ* superior, one-celled; *ovula* many, attached to two opposite parietal receptacles. *Berry* one-celled. *Seeds* few, nidulent. *Embryo* without perisperm.

W. *edulis. R.*

Shrubby, scandent. *Leaves* opposite, oblong, acuminate. Flowers in small axillary fascicles. *Berries* very large, spherical.

Luti-am, is the vernacular name in Chittagong, Silhet, &c. where it grows to an immense size, running over the largest trees. It is in flower and fruit nearly the whole year. *Bark* of the trunk and large branches of large, old plants, above half an inch thick, inwardly dark brown; surface tubercled; taste somewhat astringent. *Leaves* opposite, short-petioled, oblong, acuminate, entire, polished, veins simple, and parallel; length from three to five inches, and the breadth one or two. *Peduncles* axillary and terminal solitary, short, each supporting a few middling sized, pale pink coloured, short-pedicelled flowers, forming small fascicles. *Bractes* solitary, at the base of each pedicel, ovate. *Calyx* one-leaved, five-toothed. *Segments* ovate, subciliate. *Corol* one-petalled, infundibuliform; *tube* gibbous near the middle where the stamina are lodged, a little hairy on the inside; *border* of five, sub-lanceolate, smooth, expanding segments which are imbricated in the bud. *Filaments* short, inserted into the tube of the corol, a little above its base. *Anthers* sub-sagittate, but do not adhere to each other

II. 58

on each side a polliniferous groove. *Germ* superior, ovate, smooth, one-celled; *ovula* many, attached to two opposite parietal receptacles. *Style* short. *Stigma* conical, and closely embraced by the anthers. *Berry*, the size of a large lemon, subovate, covered with a thick, friable, pretty smooth, brownish yellow cortex, one-celled. *Seeds* many, nidulent, in a soft, yellowish pulp, which is intermixed with softer cottony fibres; size, of a small garden bean; shape various. *Integuments* two, *exterior* rather fleshy, and seems to furnish the soft fibres with which the pulp is intermixed; *interior* thin and friable. *Perisperm* none. *Embryo; cotyledons* conform to the seed, of a firm, straw colour with a tinge of pink, while fresh; if wounded, a quantity of milk exudes which soon becomes bad. *Caoutchouc. Radicle* small, roundish *vaga.*

Every part of the plant on being wounded discharges copiously a very pure white viscid juice which is soon, by exposure to the open air changed into an indifferent kind of elastic rubber, or *caoutchouc.* The fruit is eaten by the natives where it grows, and is by them reckoned good.

CHENOPODIUM. Schreb. gen. n. 435.

Calyx beneath, five-leaved, or five-parted, permanent. *Corol* none. *Seed* solitary, covered with a thin membrane, and closely embraced by the permanent calyx.

1. C. *album. Willd.* 1302.

Annual, erect, from two to eight feet high. *Leaves* long-petioled broad, trowel-shaped, obtuse, toward the posterior angles dentate, lobate, mealy. *Panicles* terminal, erect, contracted, leafy.

Beng. Betu-sag; used by the natives for a pot herb.

It is common in Bengal and many other parts of India.

2. C. *viride. Willd.* 1. 1303.

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Annual, erect, from two to nine feet high. *Leaves* long-petioled, narrow trowel-shaped, toward the posterior angles dentate-lobate, mealy while young. *Panicles*, terminal, erect contracted, leafless, very minute.

In India we have two varieties of this species; one entirely green; the other with the angles of the stem and branches of a beautiful purple colour, and the leaves, and the mealy panicles somewhat reddish. The leaves of both, as well as those of *album* are eaten by the natives, and are very frequently cultivated by them for that end.

3. *C. laciniatum. R.*

Annual, erect, three or four feet high. *Leaves* long-petioled, multifid, mealy. *Panicles* terminal, erect, contracted.

Common in the vicinity of Calcutta during the dry season.

BETA. Schreb. gen. n. 436.

Calyx five-leaved. *Corol* none. *Seeds* reniform, within the substance of the base of the calyx.

B. bengalensis. R.

Annual, erect; inferior leaves, petioled and trowel-shaped; superior, sessile, and lanceolate. Flowers in pairs; leaflets of the calyx, equal and not toothed.

Beng. Palang.

I cannot be certain whether this differs from *maritima* so much as to render it necessary to make it a distinct species; however, I think it may, as it always grows erect, and with its numerous branches nearly so. It is much cultivated by the natives of Bengal and the north-

ern Circars. The leaves they use in their stews, &c. Flowering time the cold season. Page Carey Ed.

Root ramous, annual. *Stem* erect, ramous, furrowed, smooth, pale green, the whole height from one to three feet. *Leaves* alternate, the lowermost large, petioled, trowel-shaped, and running down the petioles, smooth, succulent, with waved margins; the superior, or floral leaves small, subsessile, incurved, nearly lanceolate, and with curled margins. *Spikes* very long. *Flowers* rather remote, always in pairs. *Calyx: leaflets* equal, without teeth, or process of any kind; margins membranaceous. *Filaments* inserted into a ring round the flower. *Styles* from two to four, short. II. 60

SALSOLA. Schreb. gen. n. 437.

Calyx five-leaved. *Corol* none. *Capsules* one-seeded. *Seed* screw-shaped.

1. *S. nudiflora. Willd.* 1. 1313.

Prostrate, perennial. *Leaves* entire, linear, obtuse, fleshy. *Spikes* terminal, long, ramous. *Flowers* fascicled, trigynous.

Teling. Rawa-cada.

It is a native of salt, barren lands near the sea and flowers the greater part of the year.

Stems perennial, many, spreading close upon the ground, and often striking root, ramous, extremities of the branches ascending; *young parts* smooth, and coloured reddish. *Leaves* alternate, sessile, linear, fleshy, obtuse, smooth, generally about half an inch long. *Spikes* terminal, erect, very long, compound, leafless. *Flowers* very numerous, collected in little fascicles. *Filaments* inserted into the bottom of the divisions of the *calyx*. *Styles* three, spreading. *Seeds* smooth, horizontal, oval, beaked, covered by a thin membrane, and that by the permanent *calyx*.

This plant is very common in many places near the sea; the natives gather it for fuel only. The taste is strongly saline, no doubt it would yield good *Fossil alkali.* How many valuable sources of wealth, and happiness lie lost to the world, over many parts of the Company's Territorial possessions in India for want of encouragement, and enterprizing men. II. 61

The two species of *Salicornia,* already described, and this plant, might be made to yield *barrilla* sufficient to make *soap* and *glass* for the whole world; at the same time such a work would give bread to thousands of poor starving labourers; which no doubt would greatly promote population, and the consumption of the productions of these fertile countries; for, except during years of remarkable drought, there is always more grain produced than can be sold on the spot, I will not say than can be eaten, because few of the poorer classes can, at the best of times procure a sufficiency of food during the dry season of the year, when there is little or no employment for them. It therefore appears the more necessary to institute such branches of manufacture as will employ those people during the dry season; such as gathering these plants and burning them for the *Alkali.*

Our extensive, and I may also say impenetrable forests *(Jungle)* which occupy such large tracts of the best lands in India might by degrees be cleared, and turned into potash, for the same reasons, and by the same means. Certainly labour is as cheap here as in Russia, where the largest quantities of that useful commodity are made. In this hot climate we have many advantages that the Russian manufacturer must ever remain deprived of; viz. immense tracts of wood of the most solid texture which requires little labour to prepare it for the fire, on account of the great drought and heat which prevails at the season this manufacture could best be carried on. The same heat and drought is fully sufficient to evaporate the ley, without the least assistance of fire. All that could be necessary, would be some broad shallow vessels, exposed to the sun, and wind. (In this manner would I recommend the extract of my new *Fever bark* to be prepared.) But to effect such highly interesting objects, the labours of an individual however inclined to promote the public good, can avail but little, when not powerfully and cordially assisted by Government. The Spanish ministry sensible of the value of that branch of commerce, has prohibited the exportation of the seed of their best *Barilla* plant, under the strongest penalties. II. 62

2. *S. indica. Willd.* 1. 1317.

Perennial, erect. *Leaves* linear, acute, semicylindrical, fleshy. *Spikes* panicled, leaf-bearing.

Teling. Ella-kura.

With *C. prostratum, Salicornias,* &c. a native of the salt moist ground near the sea. It flowers during the most part of the year.

Stem woody, perennial, erect, very short, almost immediately branching out into many diffuse, alternate ramifications which sometimes rest on the ground, but in general they are sufficiently strong to support themselves. *Young branchlets* erect. *Leaves* scattered round every part of the branchlets, erect, approximate, sessile, linear, semicylindric, fleshy, smooth; half an inch long, and one-twelfth broad. In young plants, green, in older, coloured. *Floral leaves* shorter, and thicker. *Spikes* terminal, erect, compound, or panicled, glomerate, leafy. *Flowers* small, collected at the axills of the floral leaves. *Calyx* five-leaved; *leaflets* outwardly semicylindric, within concave; *margins* slightly membranaceous. *Styles* two, or to near the base two-cleft, hairy. *Stamens* shorter than the calyx. *Anthers* globular, two-lobed. *Seed* horizontal, beaked, enclosed in a tender membrane, which is enveloped by the succulent calyx.

The green leaves of this species are universally eaten by all classes of natives who live near the sea, where it is to be had; it is reckoned very wholesome, and must be so, as during times of scarcity and famine, it is a very essential article of the food of the poor natives; they

63 dress it in their curries, &c. The leaves of this plant alone, the natives say, saved many thousand lives during the late famine of 1791, 2, and 3 : for while the plant lasted, most of the poorer classes who lived near the sea, had little else to eat.

GOMPHRENA. Schreb. gen. n. 441.

Calyx coloured, exterior, three-leaved ; *leaflets* two, converging, keeled. *Petals* five. *Nectary* cylindric, five-toothed. *Style* half two-cleft. *Capsules* one-seeded.

1. *G. globosa. Willd.* 1. 1321.

Annual, at first erect, by age diffuse. *Leaves* ovate-lanceolate. Heads solitary. *Peduncles* two-leaved.

Sans. Amlana.

Hind. Lal gool-makhmul, the crimson flowered variety. Suffet gool-makhmul, the white flowered.

Flos globosus. *Rumph. amb.* 5. *t.* 100 *f.* 2.

Wadapu. *Rheed. mal.* 10. *t.* 37.

In Gardens over India where it blossoms during the rainy and cold season, native place uncertain.

CELTIS. Schreb. gen. n. 1591.

POLYGAMOUS, HERMAPHRODITE. *Calyx* five-leaved. *Corol* none. *Germ* superior, one-celled, one-seeded, attachment superior. *Drupe* one-seeded. *Embryo* transversely inverse, with scanty perisperm.

MALE. *Calyx* five-six-parted. *Corol* none. FEMALE. *Calyx* five-six-parted. *Drupe* and *embryo* as in the hermaphrodite.

C. *tetrandra. R.*

Leaves obliquely ovate, lanceolate, serrate, cuspidate, smooth. *Flowers* axillary, triple,
II. tetrandrous.

64 A native of Nepal, from whence the seeds were sent by Dr. Buchanan to this Garden in 1802 ; in March 1809 the trees began to blossom, and ripened their seed in September ; they were then fifteen or twenty feet high, with stout, short, rather crooked *trunks*, and smooth ash-coloured *bark*. *Branches* spreading much, and ending in long, drooping, or horizontal twigs. *Young shoots* bifarious, and slightly villous. *Leaves* alternate, bifarious, short-petioled, obliquely ovate, lanceolate, the base being unequally cordate, and entire ; anterior margins obtusely serrulate ; points taper, acute and entire, rather smooth on both sides ; while young, colored, length about three inches, by one and a quarter broad. *Stipules* linear-lanceolate, caducous. *Peduncles* axillary, tern, longer than the petioles, one-flowered, generally one hermaphrodite, and two male.

HERMAPHRODITE. *Calyx*, four-leaved. *Stamina* four, longer than the calyx, and expanding with an elastic jerk, as in *urtica*, &c. *Germ*, oblong, one-celled, with one seed attached to the top of the cell. *Styles* two, recurvate, thick. *Drupe* round, size of a pea, smooth, olive colour. *Nut* obovate, apex obtuse ; base, acute, ribbed, one-celled. *Seed* solitary. *Integument* single, thin, membranaceous. *Perisperm* no other than a fleshy partial Integument, entering into the plaits of the cotyledons. *Embryo*, the size of the seed. *Cotyledons* variously folded. *Radicle* sub-superior, that is ascending toward the umbilicus or apex of the cell of the nut, &c. as in *Celtis occidentalis. Gert. sem.* 1. 374. *t.* 77.

MALE. *Calyx* and *stamina* as in the hermaphrodite. No *pistillum.*

Note. C. *occidentalis* has flowered in this Garden, but the filaments are short, and not
II. endowed with that remarkable elasticity of the Urtica, as in our Nepal species.

65 2. C. *orientalis. Willd.* 4. 995.

Arboreous. *Leaves* bifarious, obliquely cordate, serrate, five-pointed, villous underneath.

Papyrus spuria. *Kæmph. amom.* 474. *t.* 472.

Beng. Chicon.

It is common over most parts of India, particularly in Bengal, where it grows to be a small, erect tree, covered with smooth, dark-coloured bark. It is in blossom the greater part of the year.

Leaves alternate, bifarious, short-petioled, ovate-cordate, fine-pointed, minutely serrate ; above a little scabrous, villous and whitish underneath. *Flowers* axillary, collected on short, common, two-cleft, diverging peduncles.

MALE. *Calyx* five-leaved, or to the base five-parted. *Corol* none. *Stamens* five, elastic, longer than the calyx. *Pistil* an oval, abortive body, in the centre of the stamens.

Female flowers generally on a separate tree, though sometimes androgynous. *Calyx* as in the male. *Germ* oval. *Styles* two, hairy. *Drupe* small, succulent, when ripe black. *Nut* rugose, with one cell, and one seed.

This tree is neither useful, nor ornamental, nor is it of long duration.

3. C. *trinervia.*

Arboreous. *Leaves* obliquely ovate-cordate, acuminate, serrulate, three-nerved, smooth. *Flowers* pentandrous.

A middling sized tree, a native of Chittagong, where it blossoms in February and March, about the time the young foliage appears, and that of the former year begins to fall.

II. *Young shoots* a little villous, the bark of the old woody parts ash-coloured, with still
66 lighter coloured specks. *Leaves* alternate, short-petioled, obliquely ovate-cordate, remotely

serrulate, acuminate, smooth on both sides; length from four to six inches, and the breadth two and a half. *Stipules* ensiform. Page Carey Ed.

Male. *Flowers* on small, open racemes from the base of the young shoots, or solitary under the hermaphrodite ones, small and not very conspicuous. *Calyx* five-leaved. *Corol* none. *Filaments*, five, short, opposite to the leaflets of the calyx. *Anthers* oval.

Hermaphrodite flowers on slender, villous, axillary racemes, they are remote, and rather larger than the male. *Calyx* and stamina as in the male. *Germ* superior, ovate-oblong, one-celled, containing one ovula, attached to one side of the top of the cell. *Style* scarcely any. *Stigmas* two, spreading, large, and villous.

4. C. *tomentosa. R.*

Shrubby. *Leaves* long-cordate, acuminate, serrulate, three-nerved, scabrous above, very downy underneath. *Thyrses* axillary short, and dense.

Native of Chittagong where it flowers in April.

ULMUS. Schreb. gen. n. 443.

Calyx five-cleft. *Corol* none. *Germ* superior, one-celled, one-seeded, superior. *Capsules* pedicelled, compressed, membrane-winged, one-seeded. *Embryo* inverse without perisperm.

1. U. *lancifolia. R.*

Leaves obliquely-lanceolate, equally and obtusely serrulate, obtusely acuminate, hard and lucid. *Flowers* pedicelled, hexandrous. *Capsules* unequally obcordate, pedicelled.

A large timber tree, a native of the hilly parts of the province of Chittagong, where it flowers in March. *Trunk* erect. *Branches* many, extending far on every side. *Young shoots* slender, smooth and drooping considerably. *Leaves* bifarious, short-petioled, unequally lanceolate, very equally obtuse-serrate, of a very hard texture, with a lucid surface; length from two to three inches; about one broad. *Stipules* ensiform, caducous. *Flowers* numerous, small, long-pedicelled, collected in little solitary fascicles in the lower axills, or in those of the former year's leaves. *Pedicells* slender, villous, one-flowered. *Bractes* many, round the insertion of the pedicells, oval, ciliate. *Calyx* campanulate, five-toothed, smooth. *Filaments*, six, longer than the calyx, broad, smooth. *Anthers* oval, two-lobed. *Germ* superior, while in the calyx sub-sessile, but after it opens it becomes pedicelled, oblong, one-celled, containing one *ovula*, attached to the top of the cell. *Styles* two, short, broad, and villous on the inner edge. *Stigmas* simple. *Capsule* pedicelled, unequally-obcordate, very thin, scariose, winged, nearly an inch each way, one-celled. *Seed* solitary, oval, compressed. *Integument* single, thin, brown. *Perisperm* none. *Embryo* conform to the seed, inverse. II. 67

2. U. *virgata. R.*

Branchlets pendulous. *Leaves* lucid, obliquely-oblong, equally serrate, base unequal. *Flowers* crowded, short peduncled, tetrandrous. *Fruit* obliquely oval, sessile.

From China this beautiful, small slow growing tree, was introduced into the Botanic Garden at Calcutta, by Sir John Royds; where in about ten years, from the time of its arrival, it began to blossom in November, and ripened its seed in February.

Trunk in trees of ten or twelve years growth, nearly erect, short, and not thicker than a man's leg. *Branches* few, spreading much; many of the extreme branchlets run out into very long, slender, pendulous twigs. *Bark* of the young parts lighter coloured, and a little scabrous. *Height* of the whole tree about ten feet. *Leaves* alternate, bifarious, short-petioled, obliquely oblong, equally, and obtusely serrate, obtuse, of a hard or firm texture, and somewhat scabrous, yet shining on the upper surface, length one or two inches, and about half of that in breadth. *Stipules* ensiform, caducous. *Flowers* axillary, minute, several together, short-peduncled. *Bractes* several, roundish, hard, dry, dark brown, concave scales embracing the flowers before expansion, caducous. *Calyx* four, or five-parted; *segments* rounded, thin, and permanent. *Corol* none. *Filaments* four, or five; four most common, rather longer than the germ. *Anthers* large, two-lobed. *Germ* obliquely oval, one-celled, with one ovula attached to the top of the cell. *Styles* none. *Stigmas* the villous margins, of the somewhat lengthened, bifid apex of the germ. *Capsules* superior, thin, obliquely oval, and sessile in the calyx, with a broad, membranaceous, coloured margin; less than half an inch long, one-celled, &c. II. 68

3. U. *integrifolia. Willd.* 1. 1326. *Corom. pl.* 1. *N.* 78.

Leaves ovate, entire. Male flowers mixed amongst the hermaphrodite.

Tam. Tambachi-marum.

Teling. Naulee.

A large timber tree, a native of the Circar mountains. It flowers during the cold season. *Leaves* deciduous about the close of the wet season; they come out again in March.

Trunk tolerably straight, and high. *Bark* a little scabrous, of a dirty grey colour. *Branches* numerous, spreading, horizontal, forming a large shady head. *Leaves* alternate, bifarious, short-petioled, ovate, though sometimes cordate, entire, smooth, shining; from three to five inches long, and about two broad. *Stipules* lanceolate, caducous. *Flowers hermaphrodite*, and *male* mixed, and springing from little germs over the leafless branchlets.

Hermaphrodite. II. 69

Calyx or corol four, five, or six-leaved; leaflets spreading, small, oval, caducous. *Filaments* seven, eight, or nine, exceedingly short. *Anthers* linear, erect, two-lobed. *Germ* superior, obovate, emarginate, compressed. *Styles* two, short, incurved, permanent. *Stigmas* acute, woolly. *Capsule* pedicelled, orbicular, leafy, compressed, emarginate, one-celled, one-valved, not opening. *Seed* none.

Page Carey Ed.

MALE FLOWERS mixed with the hermaphrodite. *Calyx* and *Stamen* as above. *Pistil*, no rudiment of one.

Observation. The first part of the flowers that appears, is the anthers; they are then reddish; next the calyx increases, and becomes visible to the naked eye, but is at all times small, and unless looked for, is seldom observed.

The wood of this tree is reckoned of a good quality by the natives, and is employed for a variety of uses.

MOACURRA. R.

Polygamous. *Calyx* five-leaved. *Corol* five-petalled. *Nectary* a scale within the base of each petal. *Germ* superior, two-celled, cells two-seeded, attachment superior. *Capsule* two-lobed, two-celled, two-valved. *Seed* solitary, arilled. *Embryo* inverse, with perisperm.

M. *gelonioides. R.*

Moakurra, is the vernacular name in Silhet, where it is indigenous; it grows to the size of a small tree. Flowering time April and May; the seeds ripen in December. *Branches* numerous, ascending. *Bark* of the old woody parts rather rough with little whitish dots; that of the young shoots villous, and yellowish. *Leaves* alternate, short-petioled, broad-lanceolar, entire, long, taper-pointed, of a thin texture, and smooth; three or four inches
II. long by one and a quarter broad. *Stipules* subulate, villous.
70 MALE flowers numerous, small, and collected on small, axillary, solitary short-peduncled fascicles. *Calyx* five-leaved; *leaflets* oval, hoary. *Petals* five, length of the calyx, but narrower and smooth. *Nectarial scales* five on the base of the petals, small, oval, alternate with the filaments. *Filaments* five, from the receptacle, alternate with the petals, and shorter than them; *anthers* cordate.

HERMAPHRODITE FLOWERS on a different tree and disposed as in the male. *Calyx, corol, nectary,* and *stamina* as in the male. *Germ* ovate, cordate, a little compressed, downy, two-celled, with two ovula in each, attached from the apex to the top of the cells. *Styles* two, recurved. *Stigmas* somewhat two-lobed. *Capsule* transversely oval, two-lobed, soft, with grey olive-coloured down, size of a nutmeg, two-celled, two-valved, opening round the apex. *Partition* slender. *Seed* (nuts?) one in each cell, or lobe of the *capsule,* oblong, more convex, on the outside completely covered with a soft scarlet or exterior tunic. *Integuments* two besides the red aril; *exterior* of a tough fibrous ensiform texture, and very rugose on the outside; *interior* soft, and spongy. *Perisperm* none. *Embryo* inverse; *cotyledons* two, conform to the seed. *Plumula* from two to five-lobed. *Radicle* short, superior.

In habit this tree approaches Willdenow's two *Geloniums,* and in the structure and contents of the germ and mature seed vessel, they agree almost exactly, except in the absence of a perisperm in this; yet their flowers differ widely, here they are pentandrous with a five-petalled corol, male on one tree and hermaphrodite on another; completely dioecous, no corol, polyandrous.

GENTIANA. Schreb. gen. 450.

Corol one-petalled. *Capsule* superior, two-valved, one-celled; receptacles two pair,
II. longitudinally adjoined to the inside of the margins of the valvelets.
71 1. G. *verticillata. Linn. suppl.* 174.

Root creeping, perennial. *Stems* simple, erect, four-sided. *Leaves* sessile, lanceolate, three-nerved. *Flowers* verticilled; *corols* five-cleft, funnel-shaped, with five glands below the filaments.

Exacum hyssopifolium. Willd. 1. 640.

Teling. Nella-gullie.

A small, erect plant, with an annual stem, and perennial roots; a native of moist uncultivated grounds. It flowers during the wet season.

Root perennial, creeping, filiform. *Stems* herbaceous, simple, erect, from six to twelve inches high, four-sided, jointed. *Leaves* opposite approximated, cross-armed, sessile, lanceolate, three-nerved, smooth, entire, one and a half or two inches long, by half an inch broad. *Flowers* axillary, sessile, generally three-fold, vertical-like, small, white. *Corol* funnel-form. Nectary, a swelled gland at the insertion of each filament. *Filaments* short. *Anthers* within the tube. *Style* single, length of the filaments. *Stigma* large, two-lobed.

2. G. *cherayta. R. Fleming in Asiat.* 11. *p.* 167.

Herbaceous, straight. *Leaves* stem-clasping, lanceolate, three or five-nerved. *Flowers* terminal. *Corol* rotate, four-cleft, tetrandrous. *Capsules* ovate, bifurcate.

Sans. Chirata-tikta, Chirataka, &c.

Beng. Chirata.

Calamus aromaticus of the Ancients.

This famous plant is said to be found on the mountains of Nepal, and the Morungs.

Root ramous, and probably perennial. *Stems* single, straight, round, smooth, jointed, above ramous; *branches* generally decussated, nearly erect, with their extremities somewhat
II. angular; the whole height of the plant about three feet. *Leaves* opposite, stem-clasping, lan-
72 ceolate, very acute, entire, smooth, three or five-nerved; size various. *Stipules* none. *Flowers* yellow, most numerous, peduncled, the whole upper half of the plant forming an elegant, oblong, leafy decussated panicle. *Bracles* two at each division of the panicle, and like the leaves, but smaller. *Calyx* four-cleft; *divisions* linear, acute, permanent. *Corol; border* expanding,

four-parted; *divisions* as long as those of the calyx and also permanent. *Stamina* four. *Anthers* cloven at the base. *Style* single, as long as the germ. *Stigma* large, two-lobed. *Capsules* rather shorter than the permanent calyx, and corol, one-celled, two-valved, opening a little at the apex. *Seeds* numerous, affixed to two receptacles adhering to the sides of the valvelets. Page Carey Ed.

Note. When I refer this plant to the genus *Gentiana* I am guided by the capsule chiefly, otherwise I might probably have placed it with the *Exacums*.

An infusion, or decoction of the whole plant, pulled up by the root, about the time the flowers begin to decay and the capsules are well formed, is much used by the natives of Bengal, and the adjoining provinces, as a *tonic*. It appears to me to be a pure bitter, although it gives signs of astringency with a chalybeate. Its febrifuge virtues are in high estimation amongst both natives and Europeans, and I think very deservedly. Our medical gentlemen prescribe it in the same manner, and with the same intention, particularly when *Peruvian Bark* is difficult to be obtained.

CRESSA. Schreb. gen. n. 439.

Calyx five-leaved. *Corol* campanulate, with stamens inserted into the bottom of the tube. *Capsule* superior, two-celled, with from one to four seeds in each.

C. *indica. Willd.* 1. 1320.

Annual, erect, ramous, hoary. *Leaves* alternate. *Flowers* terminal, sessile. *Apices* of the segments of the corol bearded. *Capsule* bearded, four-seeded. II. 73

A small, erect, ramous annual, a native of sandy, salt lands near the sea. It flowers during the wet season.

Stem nearly erect, from six to eight inches high, hairy. *Branches* numerous, ascending, alternate, hairy. *Leaves* alternate, very numerous, sessile, the lower, or larger cordate; the upper or smaller ovate, and lanceolate; all are hairy, soft, and very small. *Flowers* terminal, sessile, small, numerous, white. *Bractes* like the leaves. *Calyx* as in *C. cretica. Corol; tube* campanulate. *Segments* revolute, outside of their apices hairy, withering. *Anthers* oblong, incumbent. *Germ*, its apex woolly. *Stigma* large, globular. *Capsules* four-seeded.

NAMA. Schreb. gen. n. 444.

Calyx five-leaved. *Corol* rotate, five-parted. *Capsules*, superior, one-celled, two-valved, *receptacle* columnar. *Seeds* numerous.

N. *Zeylanica Linn. sp. pl.* 327.

Annual, creeping. *Leaves* lanceolate. Hydrola *zeylanica. Willd.* 1. 1327. *Vahl. symb.* 2. 46.

Sans. Langali.

Beng. Kanchra Isha-langulya.

Tsjeru-vallel. *Rheed. Mal.* 10. *t.* 28.

An annual; a native of moist, or marshy ground, such as rice fields. Flowering time, the cold season.

Stems or *branches* many, creeping, round, pretty smooth, from one to four feet long. *Leaves* alternate, short-petioled, lanceolate, entire, smooth. *Flowers*, numerous about the extremities of the branchlets, or solitary, opposite to the leaves or between them; colour a deep bright blue. *Calyx* one-leaved, divided to near the bottom into five, long, narrow, pointed, hairy permanent divisions. *Corol* five-petalled, longer than the calyx. *Filaments* shorter than the corol. *Anthers* sagittate. *Styles* two, spreading.

PANAX. Schreb. gen. n. 1604. II. 74

Calyx five-toothed. *Corol* five-petalled. *Germ* two-celled; *cells* one-seeded, attachment superior. *Berry* inferior, two-seeded. *Embryo* inverse, and furnished with a perisperm.

1. P. *palmatum. R.*

Shrubby, armed. *Leaves* palmate, serrate. It is found indigenous in the moist vallies between the hills over the province of Chittagong, where it blossoms about the close of the rains in September.

Stem in healthy plants now three years old, in the Botanic Garden at Calcutta, three feet high, and as thick as a stout walking cane, very completely armed with numerous, straight, acute, brittle prickles; and on the tender young parts mixed with much appressed, short, harsh, ferruginous pubescence, which disappears by the time the parts become ligneous. *Branches* few and like the stem. *Leaves* alternate, petioled, nearly round, palmate, serrulate, smooth and firm; when very young densely clothed with ferruginous down; *lobes* from three-angular to broad-lanceolate, acute; length and breadth of the whole leaf about twelve inches, say from six to eighteen. *Petioles* nearly as long as the leaves, unarmed, columnar base thick or somewhat stem-clasping, and a small acute, stipulary process on each side. *Racemes* lateral, solitary, bearing from twenty to thirty, diverging, peduncled, globular umbellets, of small white flowers. *Bractes* tern at the base of each peduncle; some smaller on the peduncles and one still smaller under the insertion of each pedicel on their little globular receptacle; they are all ferruginous. *Calyx* minute, and minutely five-toothed. *Petals* five, lanceolar, spreading. *Filaments* five, alternate with the petals, and rather longer. *Anthers* ovate, two-lobed. *Germ* inferior, turbinate, two-celled, with one *ovula* in each, attached to the very top of the partition. *Style* short. *Stigma* bidentate.

75 2. P. *digitatum. R.*

Arboreous, armed. *Leaves* digitate; leaflets entire, lanceolate, acuminate. *Panic* pendulous. It is the Soonath, or Kota-soona of the Hindus about Silhet, where the tree indigenous and flowers in May, and produces seed in November.

It is a pretty large tree, with numerous branches spreading in all directions, the young ones armed with innumerable, short, somewhat incurved, very sharp aculei, which fall off wi the exterior coat of the bark. *Leaves* alternate, about the ends of the branchlets, digita *Leaflets* generally seven, petiolate, oblong, and broad-lanceolate, entire, smooth, acuminat from three to six inches long. *Petioles* from ten to fifteen inches long, round, smooth, a unarmed. *Petiolets* from one to two inches long. *Panicles* terminal, from two to four fe long, pendulous, and composed of many, alternate, simple, globular, long-pedicelled, sm greenish-yellow flowers. *Common peduncle* armed; *partial* or *pedicells*, with some little sca bractes; all are round, and somewhat downy. *Calyx* five-parted; *divisions* ensiform. *Pet* five, oblong, patent. *Filaments* five, rather shorter than the petals, inserted between the into a fleshy, crenate, poculiform body which embraces the germ. *Anthers* two-lobed. *Ger* sunk in the solid body just mentioned, two-celled, with one *ovula* in each, attached to the t of the partition. *Style* two, shorter than the stamina, coalesced. *Stigma* simple. *Ber* inferior, nearly round somewhat succulent, black, smooth, widely crowned with the remai ing five-toothed calyx; size of a black currant, and not unlike one, two-celled. *Seed* solita hemispheric, a small groove down the middle of the inside, covered with a single, rather toug smooth integument. *Perisperm* conform to the seed, cartilaginous. *Embryo* small, inver lodged on the outside of the upper half of the perisperm. *Cotyledons* small, oblong. *Radi*

II. oblong, superior.

76 3. P. *fragrans. R.*

Arboreous, unarmed. *Leaves* supra-decompound; *leaflets* obovate oblong, acuminate su entire, smooth. *Panicles* terminal.

Gootee-soona is the vernacular name of it in Silhet, where it grows to be a middling siz tree. Its immense panicles of fragrant blossoms appear in October and November, and t seed ripens in February and March.

Leaves alternate, approximate, oppositely supra-decompound, from two to four feet lon *Leaflets* ovate-oblong, entire, except in young plants, then remotely and very sharply ser late, all rather obtusely acuminate, and smooth; from two to six inches long, and about h that in breadth. *Petioles* perfectly round, polished; *base* sheathing, and swelled. *Panic* terminal, immensely large, and composed of numerous compound branches of short pedunc globular umbellets of small fragrant flowers, embraced by a minute, ferruginous mealy inv lucre. *Calyx* superior, five-toothed. *Petals* five, spreading, oblong-lanceolate, a ridge do the middle on the inside. *Filaments* five, alternate with, and longer than the petals. *Anth* ovate. *Germ* inferior, two-celled, with the *ovula* in each attached from its upper end to t partition. *Styles* two, short, woolly. *Stigma* simple. *Berries* two-lobed, a little flatten two-celled, size of two small peas joined. *Seed* solitary, attached as in the germ. *Perisper* conform to the seed. *Embryo* minute, lodged almost transversely in the apex of the perisper with the point of the radicles a little elevated towards the umbilicus.

4. P. *fructicosum. Willd.* 4. 1127.

Shrubby. *Leaves* supra-decompound; *leaflets* lanceolate, acutely serrate, often lacinia *Umbellets* globular, forming terminal panicles.

II. Scutellaria tertia. *Rumph. amb. vol.* 4. *t.* 33.

77 This elegant erect shrub, was introduced into the Botanic Garden near Calcutta from t Moluccas in 1798, and in April 1800 blossomed for the first time. There were only two pla originally, and both completely hermaphrodite.

Trunk straight, but short, soon dividing into many *branches*; general height from f to eight feet. *Bark* dark coloured, with many small, ash-coloured, scabrous dots. *Leaves* ternate, recurved, supra-decompound; from ten to fifteen inches long. *Pinnæ* and lower p of *Pinnulæ* opposite; there are generally about six pair of the former, but the number of t latter is very unequal. *Leaflets* lanceolate, often variously laciniate, serrate; *serratures* en ing in subulate, inoffensive points, smooth on both sides. *Petioles* stem-clasping, rou smooth, maculated, jointed, and swelled at the joints. *Inflorescence* may, I think it shou be called a terminal panicle, composed of numerous, small subrotund simple umbellets. *volucres* most minute, caducous. *Perianth* small, generally five-toothed, permanent. *Pet* five, linear, first spreading, then reflexed. *Filaments* five, alternate with, but shorter than t petals. *Anthers* oblong. *Germ* inferior, generally two-lobed though sometimes three. *Sty* short, two or three according as there are lobes in the germ. *Berry* two or three-lobed, sma lead-coloured. The pulp stains paper of a dark violet colour. *Seeds* one in each lobe of t berry.

It is readily propagated from cuttings and suckers.

5. P. *conchifolium. R.*

Shrubby. *Leaves* simple, round-cordate, acutely serrate, concave.

Scutellaria. *Rumph. amb.* 4. *t.* 31.

II. A pretty large, very erect, smooth shrub, a native of the Moluccas, from thence intr
78 duced by way of Madras into the Botanic Garden at Calcutta where it grows freely duri the hot and rainy season; but when the cold weather of December and January sets in sha it generally loses nearly as much, during those two months, as it gains the rest of the ye It is curious and ornamental on account of the large, lucid, deep green, concave, or ladle-sha ed leaves.

STROEMERIA. Vahl. Symb. 1. 19.

Page Carey Ed.

Corol four-petalled, or none. *Calyx* four-leaved. *Nectary* ligulato-infundibuliform. *Germ* one-celled, many seeded. *Berry* pedicelled, many-seeded.

1. S. *tetrandra. Willd.* 1. 993.

Shrubby. *Leaves* linear-oblong. *Corol* four-petalled; *nectary* infundibuliform. *Stamina* four.

Cleome fruticosa. *Linn. sp. pl.* 957. *Burm. ind. t.* 46. *f.* 3.

Teling. Chemoorda.

A large straggling, very ramous shrub; a native of old walls, dry barren ground, &c. It flowers during the greater part of the year.

Stem scarcely any, but woody branches innumerable, with the extremities often drooping. *Leaves* alternate, short-petioled, oblong, or broad-lanceolate, entire, an inch and a half long.

Stipules minute. *Racemes* terminal, few-flowered, downy. *Bractes* awled, solitary. *Calyx* four-leaved; *leaflets* oval, expanding, greenish white. *Petals* four, long-clawed, equal, oval, waved, sub-erect; two placed laterally, and two above. *Nectary* tubular, erect, about as long as the claws of the petals; inserted into the upper side of the base of the pedicels of the germ, and stamens; *mouth* oblique, widening, jagged. *Filaments* four, awled, ascending, inserted into the middle of the pedicel, or column that supports the germ. *Anthers* oval, two-parted at the base. *Germ* oblong, sitting on the extremity of a long, ascending pedicel. *Style* none. *Stigma* simple. *Pericarp* a siliqua, subcylindric, pendulous, replete with firm, orange-coloured pulp, in which the seeds are immersed. *Seeds* several, kidney-form. II. 79

2. S. *trifoliata. R.*

Shrubby. *Leaves* ternate. *Flowers* two-petalled, hexandrous.

A native of Kootullum, where it was found by Dr. Berry, growing to the height of ten feet, with long, unarmed, weak branches.

Leaves alternate, ternate. *Leaflets* lanceolate, entire, smooth, about two inches long, and rather more than half an inch broad. *Petioles* scarcely half the length of the leaflets. *Stipules* subulate. *Racemes* terminal, from five to ten-flowered, villous. *Flowers* large on long villous, patent pedicels. *Bractes* minute, subulate, generally three under the insertion of each pedicel. *Calyx* of two opposite pairs of ovate, oblong, veined leaflets, the exterior pair larger, the inner more deeply coloured. *Petals* two, large, round, pure white, beautifully veined and elevated on claws nearly as long as the petals themselves which ascend opposite to the pedicel of the fructification. *Nectarium* horn-shaped, rising to a curve, just within the claws of the petals, and shorter than them; *mouth* perforated, and ornamented with a large, reflected border like a ruffle, colour a bright yellow. *Filaments* six, elevated on a long ascending pedicel, opposite to and as long as the claws of the petals, nearly erect, and about as long as the pedicel which supports them. *Anthers* linear, erect, opening on the side. *Germ* elevated rather above the anthers, on a second pedicel, or stipe, linear, one-celled, with two longitudinal rows of *ovula* attached to the inside of both sutures as in the siliquous plants. *Style* none. *Stigma* large, convex. *Capsules* berried, siliquose, subcylindric, about as thick as a goose quill, and nearly two inches long, one-celled, two-valved. *Seeds* a few; reniform, attached, as in the germ. II. 80

HOLIGARNA. R.

POLYGAMOUS. *Calyx* five-toothed. *Petals* five, germ one-celled; *ovula* single, attachment lateral. *Berry* inferior, one-seeded. *Embryo* transverse, without perisperm.

1. H. *longifolia. R.*

Cattu-tsjeru, or Kattou-tjeroe. *Rheed. Mal.* 4. *p.* 19 *t.* 9.

Leaves alternate, cuneiform, some inoffensive subulate bodies on the inside of the short petiole. *Flowers* panicled.

A large tree, a native of the mountainous parts of Chittagong, where it blossoms in January. *Seed* ripe in May and June.

Dr. Buchanan first found the male tree in Chittagong, and some years after found the female hermaphrodite in Malabar, and gave it the name *Holigarna*, from its appellation in the language of Kurnata. He thinks it is the variety called *Bibo* of the *Cattu-tsjeru, Rheed. Mal.* 4. *t.* 9. And says the natives of Malabar by incision, extract an exceedingly acrid juice, with which they varnish their targets. I am however inclined to consider *Van. Rheed's Cattu-tsjeroe* to be this very tree, and his *Bibo*, or *Tsjeeroo*, vol. 4. p. 20. to be *Semecarpus* Anacardium.

Trunk straight, in a twelve years old male tree ten inches in circumference. *Bark* smooth, ash-coloured. *Branches* patent; height of the whole tree twenty-five feet. In its native soil the trunk attains to the thickness of six feet in circumference; while the total height of the tree is above fifty. *Leaves* alternate, crowded about the ends of the branchlets, short-petioled, narrow, cuneiform, entire, acute, smooth on both sides, but paler underneath; length one or two feet, and the breadth from three to six inches. *Petioles* short and thick, and armed generally with two subulate, inoffensive, incurved, thorn-like bodies on each side of the margin. *Stipules* no other than the last mentioned subulate bodies, on the petioles. II. 81

MALE. *Panicles* axillary, single, much shorter than the leaves. *Flowers* numerous, small, dull white. *Bractes* small, ferruginous. *Calyx* five-sided; *angles* somewhat sharp. *Corol* flat, to the base five-parted, or it may be called five-petalled. *Segments* oblong, villous. *Filaments*

Page Carey Ed. five, shorter than the corol. *Anthers* incumbent.

Female-Hermaphrodite on a separate tree. *Panicles, bractes, calyx,* and *corol* as the male. *Stamina* as in the male, but much smaller, and with minute, seemingly aborti *anthers*. *Germ* inferior, a little hairy, with one compressed cell containing one compress *ovula*, attached to one side of the top of its cell. *Styles* three, recurved. *Stigmas* cresce shaped, a little hairy. *Berry* inferior, naked, exactly ovate, a little compressed, size of a lar olive, smooth, when ripe yellow, one-celled, evalvular. *Cortex* rather thick, and containi betweeen its soft lamina, numerous cells, filled with a black, rather thick, acrid fluid as the common marking nut, or Anacardium. *Seed* conform to the berry. *Integument* sing membranaceous. *Perisperm* none. *Embryo* conform to the seed, transverse. *Cotyledons* equ ovate, yellowish. *Corcle* lateral. *Plumula* hairy, acute. *Radicle* oblong, inverse, attached one edge of the cotyledons, considerably below their apex and corresponding with the

II. tachment of the *ovula* in the germ.

82 2. H. *racemosa. R.*

Leaves, alternate, linear-oblong. *Flowers* racemed.

Am-jour the vernacular name in Silhet where it is indigenous on the hills of that p vince, and grows to be a large tree. It flowers in March, and the fruit ripens in May, Ju and July. *Branches* and *branchlets* very numerous, the bark of the former ash-coloured a rather rough; of the latter, smooth, and void of pubescence. *Leaves* alternate, petiol lanceolar and linear, oblong, entire, obtusely acuminate, of a hard texture, glossy on t upper surface or rather glaucous underneath; from four to eight inches long, from one three broad. *Petioles* less than an inch in length, smooth, channelled.

Male flowers I have found on a separate tree by themselves collected on little later and terminal villous racemes, small, much crowded, olive-coloured. *Calyx* five-tooth *Petals* five, ovate. *Filaments* five, alternate with the petals, and with them inserted on t receptacle. *Anthers* ovate. *Germ* none. Hermaphrodite *racemes* as in the male but l crowded with flowers. *Calyx* superior, five-parted, permanent. *Corol* as in the male. *Fi ment* short. *Anthers* of two distinct lobes. *Germ* inferior, oval, one-celled, containing a sin *ovula*, attached to one side of the cell a little above the middle. *Style* single, very sho *Stigma* capitate. *Berry*, the size of a large olive, obliquely, and transversely oval, smoo when ripe red, pulp in considerable quantity, the fibrous pores contain a pale coloured acr thick juice as in *Semecarpus*, one-celled, one-seeded. *Seeds* transversely oval. *Perispe* none. *Embryo* transverse. *Cotyledons* conform to the seed, equal. *Plumula* two-tooth fringed. *Radicle* short, truncate lateral, directly within the umbilicus.

II.
83

SEMECARPUS. Schreb. gen. n. 501.

Calyx five-parted. *Corol* five-petalled. *Germ* one-celled, one-seeded, attachment superi *Nut* superior, cordate, cellular, one-seeded, sitting on a large, fleshy pear-shaped receptac *Embryo* inverse without perisperm.

1. S. *Anacardium. Corom. pl.* 1. *No.* 12. *Willd.* 1. 1476.

Polygamous. *Leaves* cuneiform, downy underneath. *Panicles* terminal.

Sans. Arushkara, also Bhela.

Beng. Bhela, Bhola-*tuki*, or Bela-*tuki*.

Eng. Marking Nut.

Teling. Nella-jedee.

Anacardium of the Materia Medica.

A tree, bearing male or male-hermaphrodite flowers on one and hermaphrodite another; which circumstance might remove it from the fifth, to the twenty-third class of t Linnæan system. It is a native of all the mountainous parts of India; flowering time fr May to August. Seed ripe in January and February.

Dr. König, my predecessor, who was the first that described this tree, had never m with the male, otherwise so particular a circumstance would not have been omitted by so a curate a describer as the Doctor was.

Trunk straight, covered with grey, scabrous bark, the bark of the younger parts smoot light ash-coloured, its inner substance contains in crevices, a quantity of white, soft, almo insipid gum. *Branchlets* numerous, spreading. *Leaves* about the extremities of the branc lets, alternate, petioled, somewhat wedge-formed, or oblong-obovate rounded at the apex, e tire, firm above, pretty smooth, yet harsh, whitish underneath; from nine to eighteen inch

II. long and from four to eight broad. *Petioles* one and a half, or two inches long, half roun

84 *Panicles* terminal, very large, composed of many simple spikes; that of the male tree mu slenderer, but as large, or larger, and with ramouse branches. *Bractes* many, small, caducou *Flowers* numerous, small, of a dull greenish yellow colour.

Hermaphrodite as in the *supplementum plantarum*. Page 25 and 182. *Pericarp* no *Receptacles* erect, fleshy, pear-shaped, smooth, when ripe yellow, about the size of the nu *Seed* a single nut resting upon the receptacle, cordate, flattened on both sides, smooth, shi ing, black; the cover or shell of the seed is composed of two lamina; the inner one har the outer one less so, and leathery; between them are cells which contain the black corrosi resinous juice which has long made them famous. This juice is of a pale milk colour, t perfectly ripe when it becomes black.

Male flowers on a separate tree, they are smaller than the hermaphrodite.

Calyx, and *Corol* as in the hermaphrodite. *Filaments* five, the length of the petal *Anthers* much larger than in the hermaphrodite. *Pistillum* none, or small and abortive, a

in form of a semi-globular, hairy, glandular body. Page Carey Ed.

The wood of this tree is reckoned of no use, not only on account of its softness, but also on account of its containing much acrid juice, which renders it dangerous to cut down and work upon it. The fleshy receptacle on which the seed rests are roasted in the ashes, and eaten by the natives; the taste is exceedingly like that of roasted apples. Before roasted they are astringent, and acrid; leaving a painful sensation on the tongue for some time. The kernels are rarely eaten.

The green nuts well pounded into a pulp make good lime.

The pure black, acrid juice of the cells is employed by the natives externally to remove rheumatic pains, aches, and sprains. A little is well rubbed over the part affected. But in tender constitutions it often produces inflammation and swelling, doing much more harm than good; but I think where it has not this disagreeable effect, which is generally the case, it is an efficacious remedy. It is universally employed to mark, all sorts of cotton cloth. The colour is improved, prevented from running, and fixed by a mixture of quick lime and water. The juice or resinous balsam, is not soluble in water, and is only diffusable in spirits of wine, for it soon falls to the bottom, unless the menstruum be previously alkalized; the solution is then pretty complete, and of deep black colour. It sinks in but soon unites perfectly with expressed oils. Alkaline livixia act upon it with no better success than plain water. II. 85

It is employed by the Telinga Physicians for the cure of almost every sort of venereal complaint, and is commonly prepared as follows:

Take of this black balsam, and expressed juice of garlic, each one ounce. Expressed juice of fresh Tamarind-tree leaves; cocoanut oil and sugar, of each two ounces; mix and boil them for a few minutes. A table spoonful is given to the patient twice a day. I know nothing of the efficacy of this composition.

The bark is mildly astringent, gives out in decoction a deep colour, which dies brown of various shades.

From wounds made in the bark, a dirty looking, brownish soft gum is procured, which dissolves slowly in the mouth without much taste.

2. S. *Cassuvium. R.*

Leaves alternate, lanceolar, entire and very smooth. Nut resting on a depressed fleshy, broad turbinate receptacle.

Cassuvium silvestre. *Rumph. amb.* 1. *t.* 70. II. 86

A native of the Moluccas, from thence introduced into the Botanic Garden at Calcutta in 1798, and in August, 1804, they blossomed for the first time, when they were handsome, small trees, about twelve feet in height, with many smooth ascending branches, and branchlets.

Leaves alternate, short-petioled, lanceolate, entire and very smooth on both sides; length from ten to eighteen inches, and from three to five broad. *Petioles* from one to two inches long, round, and smooth. *Stipules* none. *Panicles* terminal, thin, long-ovate, smooth. *Bractes* minute, caducous. *Flowers* numerous, small, greenish-yellow, and inodorous. *Calyx* saucer-shaped, five-toothed. *Petals* five, ovate, spreading. *Nectary* a yellow fleshy ring round the base of the germ, which becomes the fleshy receptacle of the seed. *Filaments* five, rather broad, length of the germ, inserted round the base of the nectary. *Germ* superior, roundish, one-celled, containing one *ovula* attached to the top of the cell. *Styles* three, spreading. *Stigmas* two toothed. *Nut* resting on the large smooth, yellow, fleshy, cup-shaped receptacle, obliquely-obverse, reniform, one-celled, one-valved, considerably compressed, longitudinally striated and wrinkled, colour a brownish black, and of a firm leathery consistence, composed of an exterior, and interior integument, with numerous small cells between. *Seed* single, completely filling the nut, covered with a single brown integument. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, conform to the seed. *Plumula* two-lobed. *Radicle* conical, superior, that is, lodged between the most elevated part of the cotyledons, and at the greatest distance from the umbilicus, or base of the nut.

3. S. *cuneifolia. R.*

Leaves wedge-shaped, short-petioled, villous underneath.

A native of the range of mountains which bounds Hindoosthan on the north, from thence seeds were sent to the Botanic Garden at Calcutta, where the tree grows slowly; the heat of Bengal being, I presume, too great for this species. II. 87

OPILIA. R.

Calyx five-toothed. *Corol* five-petalled. *Nectarial* scales alternate with the *filaments*. *Style* none. *Berry* superior, one-seeded.

O. *amentacea. Corom. pl.* 2. *N.* 158.

Teling. Balee-koma.

A small tree, a native of the mountainous parts of the Circars.

Leaves alternate, bifarious, short-petioled, ovate, or oblong, entire, smooth, shining, sometimes very slightly serrulate, about three inches long, and one and a half broad. *Stipules* none. *Amenta* axillary, small, erect, before the flowers open, every where closely imbricated with small, peltate, kidney-shaped, pointed, ciliate, caducous three-flowered scales. *Flowers* small, greenish-white. *Calyx, perianth* proper, very small, five toothed. *Petals* five, spreading, oblong. *Nectary*, five short, thick, fleshy, clubbed bodies alternate with the *stamens*. *Filaments* five, spreading, shorter than the petals. *Anthers* ovate. *Germ* superior, oblong. *Style* none. *Stigma* single. *Berry* size of a cherry, globular, juicy, one-seeded.

Page Carey Ed.

BOSEA.

Calyx five-leaved. *Corol* none. *Berry* superior, one-seeded.

1. B. *trinervia. R.*

Arboreous. Leaves oval, pointed, entire, three-nerved. *Male* flowers under the herma phrodite ones.

II. 88 A large tree; a native of the Circar mountains. *Bark* pretty smooth, and brown. *Leave* alternate, bifarious, short-petioled, ovate, pointed, three-nerved, smooth, entire; when youn a little downy, about five inches long, and two and a half broad. *Stipules* filiform, hairy caducous. *Racemes* axillary, slender, erect, sometimes compound, but generally simple. Th hermaphrodite flowers always about the male.

Hermaphrodite. *Calyx* or corol five-leaved; leaflets spreading, oval. *Filaments* five spreading, shorter than the pistil. *Anthers* incumbent. *Germ* superior, ovate. *Styles* two erect. *Stigmas* simple. *Berry* ovate, size of a cherry, one-seeded.

Male *flowers* on the same raceme, below the hermaphrodite ones. *Calyx* and *stamin* as above. *Pistil,* not the least rudiment of one.

HYDROCOTYLE. Schreb. gen. n. 457.

Umbel simple. *Involucre* from two to four-leaved. *Petals* entire, *fruit* compressed, gib bous, two-partible.

1. H. *asiatica. Willd.* 1. 1362.

Creeping in shady places. *Leaves* long-petioled, reniform, dentate. *Umbellets* from th joints, two or more together, short-peduncled, three or four-flowered. *Involucre* two-four leaved.

Codagen. *Rheed. mal.* 10. *t.* 46.

Hind. Thul-kura.

It is common in moist shady places over India, and appears with most luxuriance durin the rains, when it blossoms and ripens its seed.

2. H. *rotundifolia. R.*

Filiform, creeping. *Leaves* long-petioled, round, lobate, crenate, smooth. *Umbellets* erect II. from eight to ten flowered. *Involucre* of three, four or more minute leaflets.

89 A small creeping species, found in wet, cultivated spots in the Botanic Garden at Cal cutta during the rains.

VAHLIA. Schreb. gen. n. 452.

Calyx five-leaved. *Corol* five-petalled. *Capsule* inferior, one-celled, many seeded.

1. V. *oldenlandioides. R.*

Annual, erect, ramous. *Leaves* linear, lanceolate. *Peduncles* solitary, two-flowered.

Oldenlandia pentandra. *Willd.* 1. 676. *Retz. obs.* 4. *n.* 64.

A native of cultivated lands on the coast of Coromandel; it appears only during th cold season.

Stem erect, annual, round, jointed, ramous, a little downy, about a foot high. *Leave* opposite, sessile, spreading, linear, lanceolate, entire, downy; about an inch long. *Peduncle* axillary, solitary, erect, rather shorter than the leaves, each bearing two small, yellow flowers *Petals* nearly as large as the calyx. *Capsule* crowned with the calyx, one-celled, opening a the apex. *Receptacles* two, affixed by the apex. *Seeds* numerous.

I believe König called this plant Cyrilla Oldenlandioides.

2. V. *viscosa. R.*

Annual, sub-erect, ramous, downy, and clammy. *Leaves* lanceolate. *Peduncles* two fold, very short, one flowered.

Oldenlandia digyna. *Willd.* 1. 674. *Retz. obs.* 4. *n.* 65.

A native of the same places with the former, and appears during the same season.

Stem not so straight as that of the former, less branchy, shorter, more downy, and II. little glutinous. *Leaves* opposite, sessile, from lanceolate to linear; all are entire, pointed 90 and downy; from half an inch to an inch long. *Stipules* none. *Flowers* paired, axillary very short-peduncled, small, yellow.

The rest as in the genus.

This is, I think König's *Cyrilla viscosa.*

DAUCUS. Schreb. gen. n. 466.

Corollets sub-radiated, all hermaphrodite. *Fruit* hispid with hairs.

D. *Carota. Willd.* 1. 1389.

Seeds hispid. *Petioles* nerved underneath.

Sans. Grinjana or Gargara.*

Hind. and *Beng.* Gajur.

Persian. Zerduk.

Arab. Istufleen or Gazir.

It is said to be a native of Persia. In India it is only found in a cultivated state.

* I find no authority for these Sungskrit names.—W. C.

FERRULA. Schreb. gen. n. 475.

Page Carey Ed.

Fruit oval, flat, compressed, with three strias on each side.
F. *Asiafoelita Willd.* 1. 1413.
Leaves alternately sinuate, obtuse.
Beng. Hing.
Pers. and *Arab.* Unjudan.
Native of Persia. It does not appear that this valuable plant has ever been found in any part of India, or to the east of that country.

LIGUSTICUM. Schreb. gen. n. 478.

Umbelliferous, with both universal, and partial involucres. *Fruit* oblong, five-furrowed on both sides. *Corollets*, equal, all fertile, with petals involute and entire. II. 91

1. L. *Ajowan. R. Fleming in Asiat. Res.* 11. 170.

Annual, erect. *Leaves* supra-decompound, with filiform leaflets. *Ridges* and *furrows* of the seed distinct, and scabrous.

Sans. Bruhmadurbha, Yuvanika, &c.
Hind. & Beng. Ajouan, Ajwan, or Jouan.

This is one of the most useful and at the same time grateful of the umbelliferous tribe. It is much cultivated in Bengal, during the cold season. I never saw it wild.

Root annual. *Stem* erect, the whole plant from one to three feet high; *branches*, alternate, smooth, and slightly striated. *Leaves* sparse; those nearest the base of the plants supra-decompound; the superior, less so; all have smooth, filiform sub-divisions, or leaflets. *Umbels* terminal, erect, compound, universal, of from six to eight rays, on rather unequal peduncles, partial, of many rays, on unequal pedicels. *Calyx; involucres* universal, and partial, from five to eight, linear, unequal, shorter than the umbels, and umbellets, permanent. *Proper perianth* superior, most minute. *Corol, universal* uniform. *Corollets* pure white, all equal, hermaphrodite, and fertile. *Proper* of five equal petals, furrowed on the back, and keeled within, with involute apexes and broad waved, rather reflected margins. *Stamens* as long as the petals. *Anthers* reddish. *Fruit* didymous, or two seeds united, of a compressed, broad, ovate form, with five scabrous ridges on each side.

I can scarcely imagine that this very famous Indian plant is unknown to our European Botanists; at the same time I cannot find any one of the whole natural order hitherto described to which I can refer it unless it be *Bunium aromaticum.* I do not find that it was known to Dr. König, nor did I ever see it but in Bengal.

The seeds, like those of caraway, have an aromatic smell, and warm pungent taste; they are much used by both natives and Europeans, for culinary, and medicinal uses; they are among the smallest of the umbelliferous orders, and are to be met with in every market in India. II. 92

2. L. *diffusum. R.*

Annual, diffuse. *Leaves* decompound, and supra-decompound. *Furrows* of the seeds deep, and smooth. *Involucres*, and *involucles* with membranous ciliate margins.

Beng. Junglee-ajouan.

It is found wild in the vicinity of Calcutta, during the cold, and the beginning of the hot season; it delights in shady moist places.

Root ramous. *Stems* and *branches* diffuse, flexuose, striated, dichotomous, from one to two feet long, slightly hairy. *Leaves* alternate, long-petioled, decompound, and supra-decompound, divisions variously formed, and jagged, a few small hairs over them and the petioles. *Umbels* leaf-opposed, and terminal, compound. Universal and partial of from twelve to twenty-four rays, on nearly equal peduncles, and pedicels. *Calyx; involucres* universal and partial, of from six to eight, sub-membranous, linear-lanceolate, ciliated, spreading, reflected leaflets. *Perianth, corol,* &c. as in L. ajowan. *Fruit* of a compressed, rounded shape, with five smooth ridges on each side.

The seed is used as a medicine for cattle.

CUMINUM. Schreb. gen. n. 483.

Fruit ovate, striate. *Umbellets* and *Involucres* four-cleft.
C. Cyminum. Will. 1. 1440.
Hind. and *Beng.* Zeera or Jeera.
Sans. Jeera, Jeeruka.
Arab. Kimoon. II. 93
A Native of Persia, &c. and the western parts of Asia.

PHELLANDRUM. Schreb. gen. n. 485.

Umbelliferous, no universal involucre; partial one, many-leaved. *Florets* equal, all fertile. *Fruit* ovate, smooth, crowned with the calyx, and styles.

P. *stoloniferum. R.*

Stoloniferous, erect. *Inferior leaves bipinnate; superior* quinate, and ternate; *leaflets* lanceolate, serrate.

Beng. Pan-turasee.

A native of Bengal, and found flourishing in, and on the margins of sweet water, about

Page Carey Ed. the beginning of the hot season.

Roots running, fistulous, jointed, emitting fibres and long creeping stolones from the joints. *Stem* erect, striated, fistulous, winding; from two to four feet high. *Leaves*, the inferior ones composed of one or two lateral pairs of ternate, and a terminal quinate portion; the superior ones, quinate and ternate. *Leaflets* lanceolate, smooth, serrate. *Umbels* leaf-opposed, long-peduncled, convex, many-rayed. *Umbellets* convex, many-rayed, with involucles of many short-ish, linear leaflets. *Calyx; perianth* proper of five, large, conspicuous toothlets. *Corol proper*, five-petalled, uniform, white, ovate, with long, inflected points. *Fruit* obovate, smooth, crowned as in the genus.

I do not find that the natives make any use of any part of this plant; its taste, both seeds and leaves is somewhat aromatic, but not palatable.

CORIANDRUM. Schreb. gen. n. 488.

Corol radiated. *Petals* inflex, emarginate. *Universal involucre* one-leaved; *partial ones*
II. halved. *Fruit* spherical.
94 C. *sativum. Willd.* 1. 1448.

Sans. Dhunyuka.

Beng. Dhunya.

N. Danga.

Cultivated over India during the cold season.

SESELI. Schreb. gen. n. 492.

Umbelliferous; *umbellets* globular; *universal involucre* none, *partial one* subulate. *Fruit* ovate, striated.

S. *bengalensis. R.*

Erect. *Leaves* bipinnate, or more; *leaflets* gashed. *Umbels* leaf-opposed. *Involucrets* of several, subulate leaflets.

Annual. It appears during the dry season upon the cool, moist, shady banks of ponds, &c.

Root annual. *Stem* erect, winding, piped, smooth, about a foot high. *Leaves* bipinnate, or more. *Leaflets* smooth, gashed, variously formed. *Umbels* leaf-opposed, short-peduncled, rigid, naked, from six to twelve-rayed, *umbellets* subglobular, short-pedicelled. *Involucrets* linear, longer than the umbellets. *Corollets* all fertile, uniform. *Petals* ovate, inflected. *Fruit* nearly globular, crowned.

ANETHUM. Schreb. gen. n. 496.

Umbelliferous, with no involucre nor involucel. *Corollets* equal, all fertile, with entire involute petals. *Fruit* somewhat ovate, striated.

1. A *Panmori. R.*

Annual, erect, ramous. *Leaves* supra-decompound. *Umbel* of ten or twelve unequally
II. elevated radiæ. *Fruit* oblong, deeply-furrowed, but not winged.
95 *Beng.* Panmuhuree.

Sans. Mudhoorika.

Mayuri. See *Asiat. Res.* 11. 156.

Like *Sowa* this plant is cultivated in various parts of Bengal during the cold season for the seed, which the natives eat with their betle and also use in their curries. Seed time the close of the rains, about the end of October. Harvest in March, when the plants perish.

Root white, nearly fusiform, and almost simple. *Stem* erect, ramous, from the base to the top, the branches also erect, round and smooth, with a uniform, pale, glaucous tinge, and not striated as in *Dill*, and *Sowa*, the general height of the whole plant from two to four feet. *Leaves* alternate, scattered, supra-decompound, divisions round, tapering, smooth and filiform, but by no means so numerous as in *A. Fœniculum* which this plant resembles. *Umbels* terminal, rather concave, but not regular, the convex, from ten to thirty-flowered umbellets, of which there are generally from ten to twenty, standing on peduncles of very unequal lengths. *Flowers* small, bright, deep yellow. *Petals* long, ovate, with their apices rolled in. *Stamens* longer than the petals. *Germ* oblong. *Styles* scarcely any. *Seeds* exactly as in *Anethum Fœniculum* and with the same taste.

The seeds of this plant, for which it is cultivated, possess a pleasant, warmish, very sweet taste, and aromatic smell so much like sweet fennel that I should certainly have thought them at most nothing but varieties of the same species, if I had not had both growing before me for several years in the Botanic Garden at Calcutta where plants of *A. Fœniculum* reared from Europe seed do not blossom till the second year, during which period the leaves are bifarious, infinitely larger and more divided than in *Panmuhuree*, which is an annual plant of only four or five months duration with the leaves at all times scattered, fewer and more
II. remote.
96 From my *Anethum Sowa*, *Panmori* differs very conspicuously in many respects, but the best mark is in the seeds. In this they are longer, less flattened and without any membranaceous rim, or border. In that, much flattened with a thin margin, like that of *A. graveolens.*

2. A. *Sowa. R.*

Annual. *Leaves* supra-decompound. *Umbel* of from five to fifteen radii, equally elevated. *Seeds* flat, with a membranous margin and three ribs on the back.

Sans. Mishreya.
Beng Sowa, shuloopa, soolpa.

Page Carey Ed.

A native of Bengal, where it is cultivated for the seeds, which are much used for culinary and medicinal purposes. Time of culture the cold season.

Root annual, in fact of only a few months duration. *Stem* winding, ramous, smooth, striated with deeper and lighter green, and covered with a whitish bloom; from two to three feet high. *Leaves* alternate, petioled, decompound, and supra-decompound, *leaflets* filiform, as in *Fennel*. *Petioles*, their lower half sheathing. *Umbels* terminal, convex, without involucres or involucels. *Calyx*, *proper*, scarcely any. *Corol*, *universal*, uniform. *Corollets* yellow, all fertile and equal. *Proper*, petals ovate-oblong, inflected. *Stamens* longer than the petals. *Germ* beneath, obovate. *Styles* scarcely any. *Fruit* oval, compressed, composed of two seeds each, with three ridges on its outside, and surrounded with a membranaceous margin.

The seeds are to be met with in every market over India, they are much used by the natives in their curries, and also for medicinal uses.

3. A. *trifoliatum. R.*

Annual. *Leaves* ternate. *Seeds* reniform, slightly striated. A native of the Circar vallies; not cultivated.

II. 97

APIUM. Schreb gen. n. 499.

Involucre one or more leaved. *Petals* equal *Flowers* all fertile. *Fruit* small, gibbous, ribbed. *Style* deflexed.

Annual, glaucous, villous, superior leaflets filiform both general and partial about six-leaved.

Beng. Chanoo, also Radhooni.
Hind. Ujmood, Ujmud.

I have only met with this plant in its cultivated state and it is often raised in our Gardens in India as a substitute for parsley, *A. petroselinum*. It is cultivated over many parts of Bengal during the cold season, for the seed only, which the natives use in diet, and medicine; the leaves they make no use of.

Root annual, white, penetrating deeply into the soil. *Stem* erect, flexuous, glaucous, slightly villous. *Branches* numerous, and like the stem; height of the whole plant about three feet. *Leaves* alternate, petioled, decompound by ternary. *Leaflets*, of the lower leaves broad, variously and deeply cut; of the superior ones narrower, ever to linear, and often simple. *Umbel*, *universal*, generally of about six spreading rays; in luxuriant plants these are sometimes proliferous; *partial*, of from twelve to twenty. *Involucre* and *Involucels* of about six villous subulate leaflets. The first shorter than the rays; the latter of nearly the same length. *Flowers* numerous, all fertile, white. *Perianth* scarcely any. *Petals* ovate, with a long, taper, inflected apex. *Seed* small, ovate, villous, gibbous, and three-ribbed on the back.

II. 98

PENTANDRIA TRIGYNIA.

RHUS. Schreb. gen. n. 502.

Calyx five-parted. *Corol* five-petalled. *Germ* superior, one-celled, one seeded, attachment, base and vertici. *Drupe* one-seeded. *Embryo* inverse, without perisperm.

1. *R. succedaneum. Willd.* 1. 1497.

Arboreous. *Leaflets* five pair, entire, oblong-lanceolate. *Petioles* simple. *Berry* oblique.

Arbor vernicifera spuria, &c. Kœmpf. Amœn. 794. *t.* 795.

A small tree, in blossom, was received from Dr. Berry at Madras, into the Botanic Garden at Calcutta in April 1801, which came originally from China. It had not in March 1809 attained a greater height than about ten feet, so slowly does it grow, but it blossoms annually during the hot season and produces an abundance of fruit.

Trunk short, with but few, ascending *branches*, covered with smooth ash-coloured *bark*. *Leaves* about the ends of the branches, alternate, unequally pinnate, from six to twelve inches long. *Leaflets* from four to six pair, opposite, obliquely broad-lanceolate, long, taper-pointed, drooping, entire, perfectly smooth on both sides; from three to four inches long, and about one inch broad. *Petioles* round, and smooth. *Panicles* axillary or from the base of the naked branchlets of the present year's shoots, spreading, ovate, very ramous. *Flowers* small, very numerous, short-pedicelled, yellow. *Bractes* small, one-flowered. *Calyx*, here it may be said to consist of five-leaflets. *Petals* five, oblong, first spreading, but soon becoming reflected back over the calyx. *Nectary* a five-lobed cup, as in the *Rhamni*, between the base of the germ, and the insertion of the petal and stamens. *Filaments* five, the length of the corol, erect, inserted, alternate with the petals. *Anthers* ovate-oblong. *Germ* superior, conical, one-celled, containing one *ovula* attached from its apex to the bottom of the cell. *Style* short. *Stigma* three-lobed. *Drupe* the size of a pea, obliquely-reniform.

II. 99

2. R. *Bucki-amela. R.*

Arboreous. *Leaves* pinnate; *leaflets* five-pair, ovate, serrate, villous; exterior half of the petiole winged. *Panicle* terminal. *Berries* orbicular, compressed, viscid.

Buck-amela is the name under which it was sent from Nepal.

October, 1800. There are now many of the young trees in the Botanic Garden, in full blossom. The seeds were received from Nepal about two years ago. At present they are from

Page Carey Ed. six to twelve feet high, with an erect, soft, woody stem, and a few simple, ascending branches. *Note*, in 1812. They scarcely ever grow larger.

Leaves alternate, pinnate, from one to two feet long. *Leaflets* from four to six pair, opposite, subsessile, ovate, oblong, serrate, pointed; of a thick, firm texture; villous on both sides, and whitish underneath; from four to six inches long, and from two to three broad. *Petioles* round, somewhat villous, the exterior joint or two often winged. *Panicles*, a very large, expanding one terminates the branches, and single smaller ones spring from the exterior axills. *Flowers* numerous, small, pale yellowish green. *Calyx, corol, stamina and pistillum* as in the genus; the germ contains only a single *ovula* from the apex of which the umbillical cord proceeds to the bottom of the cell where its attachment is. *Drupe* the size of a pea, orbicular, compressed, when ripe, greenish-white, with a tinge of yellow near the apex and somewhat clammy. *Nut* smooth, dark brown, much compressed.

The *berries* or little *drupes* are covered with a very small portion of a pulpy envelope
II. which is of a sharp, acid taste, and in Nepal, I am told, is much esteemed.
100 3. *R. parviflorum. R.*

Subarboreous; all the tender parts very downy. *Leaves* ternate; *leaflets* sessile, obovate, anterior margins serrate-crenate. *Panicles* terminal.

A small bushy tree, a native of Nepal from thence introduced into the Botanic Garden at Calcutta where it blossoms during the rainy season.

SAMBUCUS. Schreb. gen. n. 505.

Calyx five-parted. *Corol* five-cleft. *Berry* three-seeded.

S. *Ebulus. Willd.* 1. 1494.

Herbaceous. *Leaflets* from seven to nine, sessile, lanceolate, finely serrate. *Stipules* quaterni (four on each side,) leafy, unequal. *Cymes* from three to six-parted.

A native of Rungpore in Bengal. It flowers during the rainy season. Its taste is simple herbaceous and has nothing of the ungrateful smell of the Europe plant. It may be a different species, though I cannot at present fix on a different character.

TAMARIX. Schreb. gen. n. 510.

Calyx five-parted. *Corol* five-petalled. *Germ* superior, one-celled, many seeded, attachment parietal. *Capsule* one-celled, three-valved. *Seed* comose. *Embryo* centrifugal; no *perisperm.*

1. T. *indica. Kön. Mss.*

Arboreous. *Panicles* terminal, racemed. *Style* single and short. *Anthers* double, and crowned.

T. *Chinensis. Lour. Cochin Ch.* 228.

T. *Articulata. Vahl. Symb.* 2. 48. *t.* 32. *Willd.* 1. 1498.

Sans. Jhavuka.

II. *Beng.* Jhou, Jhouca, Jhaoo.
101 This species grows to be a middling tree, is a native of sandy islands in large rivers or on their sandy banks, or in the vicinity of the sea, between Upara and Pantacota, on the coast of Coromandel. It flowers during the latter part of the rainy season.

Trunk often as thick as a man's body, from six to twelve feet high, generally crooked. *Bark* scabrous. *Branches* numerous spreading in every direction; their bark greenish, with brown scabrous specks. *Leaves* minute, sessile, pressing close to the *branchlets;* on the extremities of the young shoots, imbricated; on those more advanced in size, more remote, occasioned by the increasing size of the branchlets. *Flowers* small, white, exceedingly numerous, collected on many terminal racemes forming a very large, beautifully drooping panicle. *Bractes* leaf-like, solitary, one-flowered. *Filaments* twice the length of the petals. *Anthers* four-lobed, with a terminal point. *Style* short, single, more than half way three-cleft; *divisions* or *stigmas* recurved, feathery.

When it meets with a good soil, it has a very elegant appearance, particularly when in flower.

2. T. *dioeca. R.*

Dioecous, arboreous. *Leaves* short, obliquely truncated. *Panicles* terminal. *Male flowers* pentandrous. *Female* with five abortive stamens.

Beng. Lal Jhou.

Picpula. *Asiat. Res.* 4. *p.* 268.

A native of the islands in the Ganges and of its banks above Sook-saugor, where it blossoms during the rains, at which period, in some situations, little more than the tops of the plants are to be seen above water. In our gardens it is in flower the greater part of the year and is highly ornamental.

II. *Trunk* short, covered with dark-coloured, cracked bark. *Branches* very numerous, spread-
102 ing in every direction with their extremities drooping. *Leaves* tubular, obliquely truncated, pointed, smooth; in fact, they appear more like joints of the bark than leaves. *Spikes* terminal, simple, cylindric, often drooping, and so numerous as to compose the most beautiful drooping panicles on the extremities of the branches and branchlets. *Flowers* very numerous, sessile, small, rose-coloured, inodorous. *Bractes* triangular, acute, one-flowered.

Male Flowers. *Calyx* five-leaved. *Corol* five-petalled. *Petals* linear oblong, emarginate. *Filaments* five, longer than the petals. *Anthers* purple, two-lobed, with a projecting gland

between them. *Pistillum* nothing more in all the flowers I examined, than a three-lobed gland in the centre of the flower. Page Carey Ed.

Female Hermaphrodite Flowers on a separate plant.

Calyx as in the male. *Petals* rather broader than in the male. *Filaments* five, the length of the germ. *Anthers* sagittate, glands without the appearance of pollen. *Germ* three-lobed. *Styles* three, longer than the corol. *Stigmas* clavate, recurved, retuse. *Capsules* conical, three sided, one-celled, three-valved, hid in the withered calyx, and corol. *Seeds* numerous, compressed, seemingly imbricated.

PHARNACEUM. Schreb. gen. n. 517.

Calyx five-leaved. *Corol* none. *Capsule* three-celled, many seeded.

1. P. *Mollugo. Willd.* 1. 1508.

Annual, procumbent. *Leaves* verticelled, lanceolate; *peduncles* lateral, one-flowered. *Sterile filaments* alternate with the stamina; *anther* twin; *capsule* subcylindric. *Seeds* with a reflected filament.

Alcine erecta. *Burm. Zeyl.* 13. *t.* 7.

Molluga spergularia sp. plant. 131. *Burm. flor. Ind.* 3. *t. s. f.* 4. II. 103

Beng. Ghima Sag, or Shak. Shak means a pot herb.

Common over India, generally a weed in gardens during the cold season.

2. P. *pentagynum. R.*

Annual, prostrate, dichotomous, hoary with stellate down. *Leaves* opposite, round. *Flowers* axillary.

Beng. Doosera-sag.

It appears during the cold and the beginning of the hot season, on dry land that has lately been, or is in cultivation.

Root perpendicular, seems biennial. *Stem* none, but numerous, alternate, jointed, dichotomous branches, spreading close on the ground, they are round, covered with soft, stellate pubescence, and from one to two feet long. *Leaves* opposite, petioled, obovate, or roundish, with smaller leaves in their axills; all entire and, like the branches, petioles, &c. hoary with stellate down. The *flowers* stand on the upper side of the branches between the insertions of the leaves, from two to six together, short-peduncled. *Calyx* five-leaved, the outside covered with stellate down, permanent. *Corol* none. *Filaments* generally five, though sometimes more, even as far as ten, short, inserted round the base of the germ. *Anthers* two-lobed. *Germ* above, conical, five-sided, five-celled, five-valved opening from the apex. *Seeds* numerous, reniform, ornamented with regular lines of elevated points, inserted by a large white vesiculated umbilicus to the bottom of the capsule which is continued in a seemingly superfluous white filament reflected over the seed.

The tender shoots are used by the natives in their curries.

It has the habit and appearance of *Glinus lotoides* or *dictamnoides*, but the number of stamens and total want of the nectary or corol forbid my considering it as even a species of that genus. I have repeatedly examined the flowers of different plants at different periods and places without ever being able to discover any thing like a corol or nectary, so that I must consider this a non-descript or *Glinus lotoides* itself, and that the former descriptions thereof have been inaccurate. II. 104

BASELLA. Schreb. gen. n. 520.

Calyx seven-cleft, with the two opposite divisions broader; at last it produces a berry. *Seed* one.

B. *alba. Willd.* 1. 1514.

Perennial, twining. *Leaves* cordate, smooth, entire, fleshy.

Batsalla hura, or Matto-batsalla, are its Telinga names when cultivated; and Alla-batsalla, when wild.

Poi, the Bengalee, and Hindoo name of the cultivated variety and bun-poi when wild.

Gandola alba. *Rumph. amb.* 5. *p.* 417.

The natives of the Coromandel coast reckon five varieties of this; three of these are cultivated, and two wild; the wild sorts are,

1st. Yerra, or Poha-batsalla, the Telinga name of the red wild Batsalla.

Ructa bun-poi of the Bengalees.

Basella *rubra. Willd.* 1. 1513.

Gandola rubra. *Rumph. amb.* 5. 417. *t.* 154. *f.* 2. *bad.*

Is found wild in hedges, &c. twining round other plants to a considerable extent, the stems, and branches smooth, as thick as a quill, and deeply tinged red.

2nd. Alla-batsalla, above mentioned, grows with the last in hedges, and differs from it only in the colour of the stems, and branches; here they are always pale green. II. 105

The cultivated sorts are;

1st. Yerra, or red garden Batsalla.

It differs from the wild red in being more luxuriant; it is not much cultivated.

2nd. Mattoo, or white Garden Batsalla.

Poi, of the Hindoos and Bengalees.

Like the last, it differs from the wild white only in being more luxuriant, according to the nature of the soil, and is much cultivated. The above two are generally raised from the seeds.

Page Carey Ed.

3d. Pedda, or large Batsalla of the Telingas.

B. *lucida, and cordifolia. Willd.* 1. 1514.

Poi-sag of the Hindoos and Bengalees.

Basella. *Rheed. Mal.* 7. *t.* 24.

This is much cultivated, and always from slips taken from the old plants; it grows to great size running over extensive, trellises, erected for the purpose, and generally about th houses of the natives, where its numerous, large, succulent branchlets and leaves form a mos agreeable shade to protect them from the heat of the sun. This variety is also more use as a pot herb by the natives, than any of the other four, though all are reckoned equall wholesome.

I think the whole may be reckoned varieties of one species, and probably *Basella Japo nica Burm. ind. t.* 39. *f.* 4. is nothing more than from a stunted specimen of one of thes varieties.

EVOLVULUS. Schreb. gen. n. 524.

Calyx five-leaved. *Corol* companulate, plaited. *Germ.* *Capsules* superior, two-celle cells, two-seeded.

II. 1. E. *alsinoides. Willd.* 1. 1517.

106 Perennial, diffuse, hairy. *Leaves* subsessile, oblong, hairy. *Peduncles* from one to thre flowered; *fruit* drooping.

2. E. *hirsutus. Willd.* 1. 1517.

Vistnu-clandi. *Rheed. Mal.* 11. *t.* 64.

Anagallis hirsuta minor. *Burm. zeyl. t.* 6. *f.* 1. *and t.* 9. *f.* 1. seems also the sam plant.

Is a native of the various parts of India, and in blossom most part of the year.

Root perennial. *Stem* scarcely any, but numerous, very slender, cespitose, round, bifar ous branches, which, while young, are covered with long, soft, white hairs. *Leaves* alternat bifarious, subsessile, oblong, entire, hairy on both sides. *Peduncles* axillary, solitary, long than the leaves, jointed near the middle, where two opposite, lanceolate bractes are inserted from one to three-flowered, but one is the most common number; while in blossom erec afterwards drooping. *Calyx* of five lanceolate, hairy leaflets. *Corol* rotate-campanulate, margi almost entire, deep bright blue. *Stamens* crowning the mouth of the very short tube. *Ger* ovate. *Styles* two, but each three-fourths two-cleft. *Stigmas* simple. *Capsule*, and *seed* in *Convolulus*.

3. E. *pilosus. R.*

Perennial, diffuse, hairy. *Leaves* sessile, linear-lanceolate. *Peduncles* three-flowered, ar amply bracted. *Style* single, two-cleft.

A native of Hindoosthan. In the Botanic Garden at Calcutta, it is in flower most pa of the year.

Root perennial. *Stem* scarcely any, but several, somewhat ligneous branches spread clo on the ground; tender parts clothed with soft, appressed hairs. *Leaves* alternate, remot

II. sessile, linear-lanceolate, hairy. *Peduncles* axillary, very short, hairy, three-flowered. *Flowe*

107 nearly sessile on the common peduncle. *Corol* short-campanulate, white; margins crenat *Style* single, two-cleft.

4. E. *angustifolius. R.*

Diffuse, filiform, every part clothed with brown, sericeous pubescence. *Leaves* sessil linear-lanceolate. *Peduncles* longer than the leaves, from one to three-flowered. *Styl* two, each two-cleft.

A native of the Moluccas, agreeing well with Brown's figure of *Convolvulus herbaceo erectus*, 152. *t.* 10. *f.* 2. except that his plant is erect, and nearly smooth; whereas th spreads on the ground, and is very villous. I therefore think it must be different.

PENTANDRIA PENTAGYNIA.

ARALIA. Schreb. gen. n. 525.

Involucre to the umbellet. *Calyx* five-toothed. *Corol* five-petalled. *Germ* five-celle *cells* one-seeded, attachment superior. *Berry* inferior, five-seeded. *Embryo* inverse a furnished with a perisperm.

1. A. *digitata. R.*

Subarboreous, unarmed. *Leaves* digitate. *Leaflets*, broad-lanceolate, entire. *Panicl* terminal.

Unjala. *Rheed. Mal.* 7. *t.* 28.

Hind. Dain.

A native of the Circar mountains and lately found by Dr. Buchanan about Lukshme poor. Flowering time the rainy season. Young trees are in the Botanic Garden at Calcutt where they grow luxuriantly, but always continue bushy, somewhat scandent and from t lower branches, many roots continually descend into the ground or embrace other trees. T

II. bark is smooth, and on the young shoots of a bright deep green colour.

108 *Leaves* round the ends of the young shoots digitate. *Leaflets* petiolated, generally fi or six, and of different sizes, oblong, pointed, entire, smooth on both sides, the shortest abo

the length of the common petiole. *Petioles* stem-clasping, round, smooth. *Petiolets* the largest about an inch round, and smooth. *Umbellets* globular, numerous, inserted alternately on many long, terminal, leafless ramifications the whole forming a large open panicle. *Flowers* very numerous, small. *Calyx; involucre* of the globular umbellet, scarcely any. *Perianth* a five-sided marginal elevation round the germ. *Corol; petals* five, inserted on the five marginal sides of the perianth. *Stamens* five. *Germ* inferior, five-celled, with a single ovula in each attached to the top of the cell, &c. exactly as in the ripe state. *Berry* round, size of a small pea, smooth, yellow, five-celled. *Seed* solitary, attached to the top of the cell immediately under the remains of its stigma, straight and sharp on the inner edge, convex and broad in the interior. *Integument* single, white. *Perisperm* conform to the seed, entire, pure white, of a firm and rather tough consistence. *Embryo* inverse, scarcely half the length of the perisperm. *Cotyledons* two, linear. *Radicle* cylindric, superior, immediately within the umbilicus. Page Carey Ed.

In Hedera *terebinthacea* which this species most resembles, the style which is single, is as long as the filament, and ends in a single acute stigma; consequently they cannot be the same, though in the *Banksian herbarium* I believe my plant is there marked *H. terebinthiana.*

2. A. *umbraculifera. R.*

Arboreous, unarmed. *Leaves* pinnate; *leaflets* numerous; *inflorescence* terminal.

Papaja silvestris. *Rumph. Amb.* 1. *p.* 149. *t.* 53. *f.* 1.

A native of the Molucca Islands, from thence introduced into the Botanic Garden at Calcutta in 1798; where it blossoms in April, but has never ripened its fruit in Bengal. II. 109

Trunk straight, perfectly simple, about twelve feet high, and eighteen inches in circumference, towards the top marked with the large cicatrices of the fallen leaves, otherwise perfectly smooth, and ash-coloured. *Leaves* round the top of the plant, below the inflorescence, unequally pinnate, drooping, about six feet long. *Leaflets* about twenty pair, opposite, subsessile, drooping, ovate-lanceolate, margins waved and slightly serrate, very smooth on both sides, upper surface shining; length from four to eight inches, and from two to three broad. *Petioles* smooth, sharp on the upper edge, jointed at the insertion of the leaves, and then much swelled. *Inflorescence,* I will call it an immense terminal panicle issuing as in *Corypha umbraculifera,* from the apex of the simple *Papaya*-like stem and composed of nuous, primary, diverging, compound branches, of from three to four feet in length, while the numerous diverging branchlets thereof are from six to nine inches long, and support numerous alternate diverging peduncles of small, globular heads, of from six to twelve small, sessile, greenish, stellate flowers. *Bractes* minute. *Involucres* also very minute. *Calyx* superior, obscurely five-toothed. *Petals* five, broad-lanceolate, spreading. *Filaments* shorter than the petals, spreading. *Anthers* ovate. *Germ* inferior, crowned within the insertion of the petals and stamina, with a convex, grooved, coloured gland; from its centre rise the five styles, which are in some degree coalesced, and shorter than the corol. *Stigmas* five, distinct, and simple.

LINUM. Schreb. gen. n. 528.

Calyx five-leaved. *Corol* five-petalled. *Capsule* superior, from five to six-valved, from ten to twelve-celled, with one seed in each cell. II.

1. L. *usisatissimum. Willd.* 1. 1533. 110

Annual, ramous. *Calyx* and *capsules* mucronate. *Petals* crenate. *Leaves* alternate, lanceolate.

Sans. Utusee.

Hind. Tisi.

Beng. Mushina.

Much cultivated over the Northern parts of India for the seed, from which the Hindoos extract the oil. They make no use of any other part of the plant.

2. L. *trigynum.* R.

Shrubby. *Leaves* alternate, oval. *Filaments* united at the base with alternate sterile bristles. *Styles* three. *Capsules* six-valved, twelve-celled.

Hind. Gool ashruf.

This beautiful plant I have only met with in the garden of the curious about Calcutta, though it is indigenous in Hindoosthan, and the eastern parts of Bengal. Flowering time, the cold season. It grows readily from bits of the root; consequently, is easily propagated; it is indeed, a troublesome, though beautiful weed.

Stem or rather *branches* numerous, sub-erect, the whole shrub about two or three feet high. *Bark* ash-coloured. *Leaves* alternate, short-petioled, ovate-oblong, with a bristle-like point, the larger are most minutely serrate toward the apex; both sides smooth, size very various. *Stipules* minute. *Flowers* solitary, peduncled, large, of a bright, deep, rich yellow colour, inodorous. *Bractes* none, unless some small floral leaves which surround the peduncles near the base may be so called. *Calyx* five-leaved; *leaflets* lanceolate, acute, smooth, erect, permanent. *Petals* five, claws the length of the calyx, forming as it were a tube. *Border* flat, round, entire, inserted below the bristles, into the ring formed round the germ by the union of the base of the filaments, on the outside of the neck of each petal are two small toothlets. *Filaments* five, as long as the calyx, becoming broad towards the base, and then united with five small, intermediate bristles placed between them. *Anthers* sagittate. *Germ* superior, globular, six-celled, with one *ovula* in each, attached to the top of the II. 111

Page Carey Ed. axis. *Styles* three, considerably longer than the stamens. *Stigma* headed, undivided. *Capsule* globular, smooth, size of a large pea, six-celled, six-valved. *Seeds* solitary, reniform.

This plant is highly ornamental. *Miller's* two *figures in plate* 268, are not unlike it in any respect; yet I think it is evident they cannot be the same; it seems more nearly allied to *Linum*, for in all respects the characters agree perfectly, except in the three *styles* and *capsule*. I have therefore called it *Linum trigynum*.

AEGELATIS. Brown.

Calyx cylindric sulcated, five-toothed. *Petals* five and with the five filaments, united at the base. *Germ* superior, one-celled, one-seeded, attachment from the base of the cell to the apex of the ovula.

A. *rotundifolia. R.*

Leaves alternate, orbicular; *petioles* long, sheathing and winged.

A small ramous shrub found with *Rhizophora*, &c. growing on the banks of the salt-water creeks which intersect the lower part of the delta of the Ganges. Flowering time December.

Stem scarcely any, but many ascending, smooth, dichotomous branches and branchlets. *Leaves* alternate, petioled, orbicular, entire, glossy, most finely veined, from two to three inches each way. *Petioles* as long as the leaves, sheathing, broad-winged, smooth; when they drop,
II. annular, permanent marks are left in the branches. *Racemes* axillary and terminal, the latter
112 dichotomous or even sub-panicled, round, and smooth. *Flowers* numerous, pretty large, pale yellow, short-pedicelled. *Bractes* three to each flower, oval, sheathing, clammy. *Calyx* cylindric, sulcated, clammy, mouth five-toothed. *Corol*, it may be called one-petalled, with filaments inserted on the mouth of the tube; or five-petalled, and those inserted on the tube, formed by the base of the filaments, *lamina* oblong, recurved over the mouth of the calyx. *Filaments* five, shorter than the corol. *Anthers* linear-oblong. *Germ* superior, oblong, five-grooved, closely embraced by the tube, formed by the stamina and petals, one-celled, containing a single *ovula*, pendulous at the end of a long umbilical cord which rises from the bottom of the cell. *Styles* five, rather longer than the Stamina. *Stigmas* large.

ALDROVANDA. Schreb. gen. n. 529.

Calyx five-parted. *Corol* five-petalled. *Capsule* superior, five-valved, one-celled. *Seeds* longitudinally affixed to the inside of the valves of the pericarp.

A. *verticillata. R.*

Twining. *Leaves* verticelled, wedge-shaped.

Beng. Malacca-jhanjee.

Found swimming on ponds of water over Bengal during the cold and hot season.

I have never seen it in any other form than that of detached pieces from one to three inches long, sometimes ramous, sometimes simple. The *stems* are round and smooth with verticells of six or eight leaves at every quarter of an inch or less.

Leaves sessile, verticelled, wedge-shaped, ending in four or five bristly horns of nearly
II. the same length; over the insertion of the middle pair is inserted a crescent-shaped, winged
113 utricle, the body of which is inflated, and serves to keep the plant suspended on the water. *Peduncles* axillary, solitary, about the length of the leaves and their horns, one-flowered. *Calyx, corol,* &c. as in the genus except that here the seeds are numerous.

DROSERA. Schreb. gen. n. 531.

Calyx five-cleft. *Corol* five-petalled. *Capsule* superior, one-celled opening into five valves at the top. *Seeds* numerous.

D. *Burmanni. Willd.* 1. 544.

Scapes axillary. *Leaves* radical, cuneate, spatulate, ciliate, pressing close on the ground in a circle. *Stipules* petiolary, varicose, from three to six-cleft.

Ros solis zeylanica, &c. *Burm. zeyl. t.* 94. *f.* 2.

Native of Coromandel, Ceylon, &c.

D. *indica. Willd.* 1. 1546.

Stems ramous, leaf-bearing. *Leaves* linear, ciliate.

Ros solis ramosa. *Burm. zeyl. t.* 94. *f.* 1.

Araka puda. *Rheed. Mal.* 10. *t.* 20.

A native of Coromandel, &c. Flowering time the cold season.

II. 114

CLASS VI.

HEXANDRIA MONOGYNIA.

URANIA: Schreb. gen. n. 539.

Calyx a common spathe. *Corol* six-petalled. *Germ* three-celled. *Ovula* numerous; *attachment* septal. *Capsule* inferior, three-celled, three-valved. *Seeds* in two rows, axilled. *Embryo* centripetal, and furnished with a perisperm.

U. *speciosa. Willd.* 2. *p.* 7.

Ravenalia madagascariensis. *Sonner. it. ind.* 223. *t.* 124-5 and 6. Page Carey Ed.

In 1802 three plants of this elegant tree were brought from the Island of Mauritius by Capt. Tennant to the Botanic Garden at Calcutta. They were planted in different soils, and situations. That which was in a very moist place, and in a rich brownish black soil, throve more luxuriantly than the other two, though in a soil equally rich but lighter coloured, much higher and drier; the former flowered for the first time about the close of 1806 and again in September, 1807, when the accompanying and following description was made. The seeds of the first crop of flowers ripened in November, 1807.

Trunk of the tree now in flower, simple, and straight, eighteen inches to the leaves, and thirty-six in circumference, round, and marked with the circular impressions of the leaves that have fallen off. *Leaves* cauline, bifarious, alternate approximating, petioled, erect when they first appear, and in all directions from that to diverging when about to decay, like the ribs of a semicircular fan, linear, oblong, nearly truncate at both ends, very smooth on both sides, veins simple, diverging in a waving line, length about six feet and the breadth from two to three. *Petioles* about eight feet long, sheathing, a deep groove runs along the upper edge, except for two or three inches at the apex; under side round, and smooth. *Spadix* axillary, solitary, much shorter than the petioles; in our young trees many leaves intervene; bifarious, branches simple. *Spathes*, common, three or four, alternate, embracing the stalks of the spadix, which are mostly hid in the groove of the next petiole below. Partial spathes about twelve, cuneiform, from twelve to twenty-four inches long, the inferior being about twice the length of the uppermost, each enclosing about ten flowers in each side, every one of these flowers is also embraced by its own proper spathe. *Flowers* large, white, sessile, alternate in two rows on the upper side of the branches of the spadix, before expansion, imbricated in a horizontal line; when expanded, erect, inodorous; while in blossom the spathes are all completely filled with a super-abundance of clear, gelatinous matter. *Calyx* no other than the spathes already described. *Corol* six-petalled, three inner and three outer, all nearly ensiform, straight, and of a firm rigid texture, five of them are nearly equal in size; the sixth (one of the inner three) much smaller, the other two of this series adhere lengthways by their margins, overlapping each other, which may have occasioned the corol to have been called *five-petalled*, but their distinct insertions, and separation both above and below, readily point to very distinct petals. *Stamina* six, the length of the corol. *Anthers* linear, slightly recurvate, twice as long as their thicker filament. *Germ* inferior, obliquely linear, three-celled with two vertical rows of *ovula* in each cell attached to the partition. *Style* rather longer than the stamina, straight and very stiff. *Stigma* clavate, perforated, three-lobed, lobes bidentate, and acute. *Capsule* inferior, linear, oblong, less convex on one side, and the separation marked by two opposite, longitudinal, sharp ridges; size of a small cucumber, smooth, dark brown, of a hard, tough fibrous texture, three-celled, three-valved, opening from the apex. *Seeds* many, reniform, in two rows, attached to the inner edge of the partition, each enveloped in its proper, beautiful azure-coloured axil (the robe of *Urania.*) *Perisperm* conform to the seed, white, friable. *Embryo* pointing immediately to the umbilicus of the seed, pure white; varying its shape from that of a common flask to that of a retort.

II. 115

II. 116

BROMELIA. Schreb. gen. n. 540

Calyx three-parted. *Petals* three, with a nectarial scale at the base of each. *Berry* superior, three-celled.

1. B *ananas. Willd.* 2. 7.

Leaves ciliate with spinous points. *Spike* tufted.

Kapa-tsjakka. *Rheed Mal.* 11. *t.* 1. *and* 2.

Beng. Ananas.

I do not know that it has been found indigenous in any part of India. Its not being a native of India is supported by the various vernacular names, evidently derived from *ananas*, as well as by their being no Sanscrit name for so remarkable a plant. A thing which could scarcely have happened if it had been a native of the East Indies. The general flowering time in India is about the beginning of the hot season.

There is a very beautiful striped-leaved variety of this species found at Malacca.

II. 117

BURMANNIA. Schreb. gen. n. 542.

Calyx gibbous, mouth six-toothed; the alternate one very small, (or they may be called petals.) *Corol* none. *Stamina* in pairs. *Capsule* inferior, three-celled. *Seeds* numerous.

1. B. *disticha. Willd.* 2. 16.

Leaves sword-shaped. *Spike* double.

Burmannia spica gemina. *Burm. zeyl. p.* 50. *t.* 20. *f.* 1.

It is a native of Ceylon.

Root of numerous capillary fibres, annual. *Leaves* radicle, sword-shaped. *Scape* erect, from twelve to twenty inches high, round, pointed, with a sword-shaped sheath at each joint. *Spikes* double, spreading in opposite directions. *Bractes* lanceolate, one-flowered. *Flowers* erect, subsessile on the upper side of the spikes, pale blue. *Calyx* gibbous, one-leaved; mouth six-parted, divisions alternate, larger permanent, and keeled on the back. *Corol* none, unless the three smaller divisions of the calyx be so called. *Filaments* none. *Anthers* three, joined

Page Carey Ed. to the sides of three large, ox-head-shaped glands, affixed to the calyx just below the smaller divisions thereof. *Germ* inferior, three-sided, three-winged, the wings a continuation of those of the calyx. *Style* erect. *Stigmas* three, large, emarginate. *Capsule* three-winged, three-cornered, three-celled, three-valved. *Seeds* numerous.

2. B. *triflora. R.*

Flowers about three in a terminal head. *Leaves* ensiform. Found by Mr. W. Roxburgh on Prince of Wales' Island. *Root* annual, consisting of a few small fibres. *Leaves*, few round the base, those of the scape ensiform, smooth. *Scape* filiform, erect, generally simple, invested in a few remote leaf like scales; height about six inches. *Flowers* from two to four, terminal, short-pedicelled, large, and beautiful. *Bractes* ensiform, one at the base of each pedicell. *Calyx* superior, subcylindric, amply three-winged, mouth six-toothed, the three alternate, (*Corol* of Linnæus,) very small, and ensiform. *Filaments* short in the mouth of the calyx. *Anthers* three-pair. *Germ* inferior. *Style* rather shorter than the calyx. *Stigma* three-cleft. *Segments* emarginate, adhering to the stamina. *Capsule* three-celled. *Seeds* numerous, minute, attached to the inner angle of the cells.

II. 118

TRADESCANTIA. Schreb. gen. n. 543.

Calyx three-leaved, or three-parted. *Filaments* bearded, or naked. *Germ* three-celled. *Cells* few-seeded, attachment inferior. *Capsule* superior, three-celled, three-valved. *Seeds* few. *Embryo* in the back of the ample perisperm, centrifugal.

1. T. *axillaris. Willd.* 2. 20.

Annual, creeping. *Flowers* axillary. *Calyx* one-leaved. *Corol* one-petalled. *Filaments* bearded, and clubbed.

Nir pulla. *Rheed. Mal.* 10. *p.* 25. *t.* 13.

Hind. Baga nella.

Teling. Gola gandee.

Annual, a native of moist pasture ground, borders of rice fields, &c. appearing and flowering during the wet and cold season.

Root fibrous. *Stem*, there is in young plants an erect one, but in old ones it is depressed, and appears like one of the many long creeping branches that issue from its base, all are round, smooth, jointed and often coloured. *Leaves* alternate, sheathing, lanceolate, spreading striated; *mouths* of the sheaths ciliate. *Flowers* axillary two or three, but in succession, so that there is never more than one expanded at a time, they are pretty large; colour a deep, beautiful, blue purple. *Calyx* membranaceous, three-parted. *Corol* one-petalled, funnel-formed; *tube* cylindric, twice as long as the calyx. *Segments* three, cordate. *Filaments* six, the length of the corol, and inserted into its tube near the base; toward the apex swelled into an oblong pellucid body, and a little below surrounded with beautiful, jointed hairs. *Anthers* incumbent. *Germ* superior, three-sided. *Style* the length of the stamens, and near the apex swelled like the filaments.

II. 119

Cattle are very fond of this plant.

2. T. *tuberosa. Corom. pl.* 2. *n.* 100.

Perennial, creeping; radical leaves ensiform, cauline, lanceolate, and downy. *Spikes* crested. *Corol* one petalled. *Filaments* bearded and clubbed.

A native of moist vallies.

Root tuberous, perennial. *Stems* several, creeping, round, jointed, from six to thirty inches long; there is a tuft of three or four, liliaceous, sword-shaped leaves, issuing immediately from the heads of the tuberous roots or rather their sheaths, forming a head from whence the roots and procumbent stems issue. *Leaves* of the stems linear-lanceolate, sheathing striated, under side tinged with purple and downy. *Spikes* terminal, or from the interior axills, one or two together; peduncled, beautiful, imbricated as in *F. cristata*, with two rows of falcate, ciliate bractes. *Flowers* one in the axill of each bracte, small, blue purple. *Corol* one-petalled, &c. as in the last described. *Stamens* and *pistil* as in *T. axillaris.*

3. T. *paniculata. R.*

Annual, partly erect. *Leaves* lanceolate. *Panicles* terminal. *Corols* three-petalled. *Filaments* naked.

Teling. Kunda amadikada.

II. 120

A native of moist vallies.

Root fibrous, annual. *Stems* creeping, with their extremities erect, jointed, smooth. *Leaves* lanceolate, sheathing. Mouth of the sheaths woolly. *Panicles* terminal, globular, many-flowered, hairy. *Flowers* small, blue. *Calyx* three-leaved, hairy. *Corol* three-petalled, the superior two, large, and ovate, the third lanceolate. *Filaments* simple, inserted round the germ, as long as the petals, without hairs or swelling.

4. T. *imbricata. Corom. pl.* 2. *N.* 108.

Creeping. *Leaves* lanceolate-cordate, stem-clasping and sheathing. *Spikes* secured, imbricated with two rows of bractes. *Corols* one-petalled, funnel-shaped.

Veetla caitu. *Rheed. Mal.* 7. *t.* 58.

Common on wet ground over most parts of India during the latter part of the wet season.

Root annual. *Stems* or *branches* creeping, jointed, round, pretty smooth, a small woolly ridge runs from joint to joint, being a continuation of the fissure of the base of the leaf next above; length from one to two feet. *Leaves* stem-clasping, sheathing, lanceolate-cordate, entire, somewhat fleshy, beautifully striated; margins woolly, otherwise smooth, from two to three inches long, and about one broad. *Spikes* terminal, solitary, sessile, recurved over the base of the last leaf, which may be called a common spathe, secund, imbricated with two pair

of lunulate, sessile bractes, each row generally consisting of from six to sixteen pair. *Flowers* sessile, one to each bracte, opening in succession, pale blue. *Calyx* three-parted, ciliate on the back and margins. *Corol* one-petalled, funnel-shaped; border of three equal divisions. *Filaments* inserted round the base of the germ, spirally twisted, and hairy. *Style* spirally twisted, naked. *Stigma* pitcher-shaped. *Seeds* two in each cell, pitted on the back. Page Carey Ed.

Note. The corol being of one petal precludes the idea of its being *T. cristata.*

There is a variety with dark blue flowers.

PONTEDERIA. Schreb. gen. n. 545. II. 121

Calyx, spathe common. *Corol* six-petalled or parted. *Stamina* and *style* ascending. *Capsule* superior, three-celled, three-valved.

1. P. *vaginalis. Willd.* 2. 23. *Corom. pl. n.* 110.

Leaves cordate, acute, from five to seven-nerved; *racemes* peduncled, after the flowers decay, recurved.

Carimgala. *Rheed. Mal.* 11. *t.* 44.

Sans. Neelotpala.

Beng. Nouka.

Teling. Nirocancha.

A native of the borders of sweet water lakes or marshy places. It flowers during the rains.

Root perennial, creeping. *Leaves* radical, narrow-cordate, pointed, entire, smooth, glossy; from two to four inches long, and from one to two broad. *Petioles* sub-erect, tapering, fistulous, smooth, from six to twelve inches long; those that bear a raceme are swelled a little about the middle, and there open like a spathe lengthways near the base, those that do not bear flowers are enlarged into a sheath, which embraces the exterior leaves. *Raceme* short-peduncled, after flowering time, drooping, from six to twelve flowered. *Pedicels* about three quarters of an inch long. *Flowers* blue and pretty. *Calyx* no other than the common spathe of the raceme. *Petals* six, the three exterior are the smallest, and oblong, the three interior obovate. *Filaments* ascending, inserted round the base of the germ, the lowermost one is generally broad, and two-cleft, its lower division bears a blue anther, the other nothing; the rest are yellow. *Germ* superior. *Style* single. *Stigma* gladular.

2. P. *hastata. Willd.* 2. 24. *Corom. pl.* 2. *N.* 111.

Leaves triangular, or hastate, pointed, many-nerved. *Racemes* subsessile, erect. II. 122

Teling. Neroo-Tamara.

A native of marshy places, or shallow standing sweet water. It flowers during the rainy and cold season.

Root perennial, thick, spongy, creeping when long, a little flexuose with many fibres issuing from every part. *Leaves* radical; those that bear the flowers a little more elevated, but differing in no other respect from the rest; broad-sagittate, or triangular, very entire, pointed, very smooth and glossy, from six to seven inches long, and from five to six inches broad, posterior angles generally obtuse. *Petioles* the flower-bearing longest and grooved a little, swelled near the apex, and there on the fore part, split like a sheath for the passage of the raceme; the other petioles are increased near the base into a large sheath, which embraces those within; they are tapering, sometimes spotted with small purple dots, from eighteen to twenty-four inches long, and not grooved like the flower-bearing petioles, or scapes. *Racemes* subsessile, erect, while they are in flower, while young, globular, but lengthening as the flowers expand. *Spathes* ovate. *Flowers* numerous, pedicelled, closely surrounding every part of the raceme; those nearest the apex begin to expand first, and continue in succession down; they are large, and of a beautiful bright blue, violet colour. *Pedicels* round, smooth, about an inch long. *Petals* six, withering, the three interior largest, and obovate; the three exterior oblong. *Filaments* six, short, the lower rather longer, and as in the last bifid or broad and undivided with a double anther. *Anthers* linear, erect, the lowermost one is much larger and blue, the rest are yellow. *Germ* superior, ovate, with three cells, each containing numerous ovula attached to a vertical thickened line, or a receptacle on each side of the partition. *Style* single, ascending, rather longer than the stamens. *Stigma* downy. II. 123

3. P. *Plantaginea. R.*

Diffuse. *Leaves* narrow, cordate. *Racemes* peduncled, three-flowered.

Plantaginis stellatæ foliæ. *Pluck. t.* 2215. *f.* 4. agrees much better with this, than with P. *vaginalis.*

A native of marshy, or watery places over Bengal. It flowers during the rains. *Stems* annual, and very trifling, but spreading on the ground for a few inches so that the radical fibres issue through the sheathes of the leaves and strike into the earth. *Leaves* petioled, narrow-cordate, entire, taper, obtuse-pointed, smooth; *lobes* semicircular; *nerves* about five, and faintly visible on the under-side only; the largest of the leaves is about two inches long and one broad. *Petioles* from three to four inches long, round, variously curved, with an opening about the middle on the inside for the raceme; from the mouth of the stem-clasping base, a very large tapering ligule, or bracte rises. *Racemes* peduncled, from two to four-flowered, and erect till they decay, then recurved. *Flowers* large for the size of the plant, short-pedicelled, bright, deep blue. *Calyx* the spathe of the raceme, inserted near its base. *Corol* one-petalled, to the base six-cleft; *divisions* lanceolate, the interior three narrower. *Filaments* five smaller, and one large, with a hornlet as in P. *vaginalis* and *hastata. Anthers* on the small filaments, small and roundish; on the large, sagittate, oblong. *Germ* oval, three-celled, each containing

Page Carey Ed. numerous *ovula* attached to septal receptacles not far removed from the axis. *Style* shorter than the stamina. *Capsule* oblong, three-celled, three-valved. *Seeds* numerous, round.

4. P. *dilatata. Syme's embasy to Ava.*

Leaves cordate-sagittate. *Umbel* peduncled, drooping; *flowers* numerous, long-pedicelled.

Hind. Cacheree.

II. 124 A Native of Bengal, &c. It flowers during the rainy season.

5. P. *sagittata. R.*

Leaves sagittate; *umbel* sessile; *flowers* long-pedicelled.

A Native of low wet places near Chittagong.

PANCRATIUM. Schreb. gen. n. 551.

Corol superior, infundibuliform, crowned with a campanulate, staminiferous nectary.

1. P. *zeylanicum. Willd.* 2. 41.

Leaves linear-lanceolate. *Spathe* one-flowered. *Segments* of the corol longer than the tube. *Stamens* incurved. *Nectary* twelve-toothed. *Lilium Indicum, Rumph. Amb.* 6 *t.* 70 *f.* 2. and a tolerably good figure, but *Cattuli Pola, Rheed. Mal.* 11, *t.* 40 must certainly be excluded.

A native of the Molucca Islands and of Ceylon, from both places the roots have been received into this Garden, where they blossom about the beginning of the rains.

Root a round, smooth, truncated bulb, about an inch and a half in diameter. *Leaves* radical, bifarious as far as ten or twelve from the same bulb; slightly recurved, linear-lanceolate, pointed, smooth, from six to twelve inches long. *Scape* axillary, shorter than the leaves, a little compressed, smooth, supporting a single, large, pure white, faintly fragrant flower, which expands about sunset, and fades next morning. *Spathes* membranaceous, length of the tube of the corol. *Corol* superior; *tube* cylindric; *segments* of the border linear-revolute, longer than the tube. *Nectary* or crown of the corol spreading wide in the shape of a shallow bowl. The twelve divisions of its border acute. *Filaments* scarcely so long as the segments of the border of the corol, incurved.

2. P. *longiflorum. B. H.*

II. 125 *Leaves* narrow lanceolate. *Spathe* one-flowered. *Segments* of the corol linear-lanceolate, half the length of the tube. *Stamens* incurved, scarcely longer than the divisions of the gibbous campanulate-twelve-toothed nectary.

A native of the Moluccas, from whence the roots were brought to the Botanic Garden at Calcutta in 1798. It is in blossom about the beginning of the rains.

Leaves radical, narrow-lanceolate, deep green, and smooth on both sides; length about twelve inches, and less than one in breadth.

Scapes much shorter than the leaves, and even shorter than the tube of the corol, compressed, one-flowered.

Flowers large, pure white, fragrant. *Corol; tube* pale green, cylindric, a little furrowed, about six inches long. *Filaments* incurved, and very little longer than the divisions of the nectary. *Anthers* large.

3. P. *biflorum. R.*

Leaves linear-cuneate. *Spathe* from three to four-leaved, two or three-flowered. *Corol* with a long, slender, three-sided tube and linear segments of the same length. *Sinuses* of the nectary erose. *Filaments* length of the nectary.

A native of India, but scarce. Flowering time in the Botanic Garden at Calcutta, the rainy season.

Leaves from four to eight, bifarious, erect, flat, linearly wedge-shaped, rather obtuse, smooth on both sides, slightly reticulated with transverse green veins; length about twelve inches, by one broad. *Scape* shorter than the leaves, erect, smooth, a little compressed, supporting two or three, large, pure white, faintly fragrant flowers. *Spathe* three or four-leaved, two-flowered; *leaflets* of various sizes and linear. *Corol; tube* pale whitish green, three-sided, slender, from three to four inches long, divisions of the border linear, first expanding, then re-

II. 126 curved, about as long as the tube. *Nectary* broad funnel-shaped, scarcely one third the length of the laciniæ of the corol. *Sinuses* between the filaments erose. *Filaments* about as long as the nectary, spreading. *Anthers* first yellow, afterwards brown. *Style* longer than the stamens. *Stigma* three-lobed.

4. P. *triflorum. R.*

Spathes three-flowered. *Leaves* linear acute; *Segments* of the corol shorter than the tube; fissures of the nectary alternately deeper, in which the incurvate stamens are inserted.

Beng. Sada-kanoor.

An elegant species, with large fragrant flowers.

Since writing the above, I have seen in the 2*nd. Vol. of the Linnæan Society's Transactions, Mr. Salisbury's* description of P. *verecundum*, which he thinks is P. *maritimum* of *Linnæus*, and from his accurate figures and description, find that my plant differs from his in the following respects.

1st. Here the leaves are more numerous, acute-pointed and not bifarious.

2nd. Here there are only from two to four flowers in the fascicle as also the ten divisions of the mouth of the nectary, are longer, waved, much more pointed than in his, and the filaments are at least two or three times longer than those divisions, whereas in his they are about the same length; so that I conceive this must be another species.

CRINUM. Schreb. gen. n. 553.

Page Carey Ed.

Calyx; Involucre spathaceous. *Corol* infundibuliform, six-parted. *Filaments* inserted on the mouth of the tube. *Germ* inferior three-celled; *ovula* few; attachment lateral. *Berry* inferior; somewhat fleshy, evalvular, containing two or three bulbiform seeds.

II. 127

Sec. 1*st.* Flowers Regular.

1. *C. amoenum. R.*

Bulbs spherical. *Leaves* linearly tapering, smooth, margined, length of the inflorescence; *umbels* from four to six-flowered, regular, sessile.

An elegant small species; a native of Silhet where it is called *Gocinda* by the natives. It flowers in April and May, as well as now and then during the rains.

Bulbs small, and nearly round. *Stemless. Leaves* from six to twelve from each bulb, sparse, linear, toward the apex tapering, straight, more or less channelled, particularly toward the base; *margins* slightly scabrous; from one to two feet long and about an inch and a half broad. *Scape* from the axills of the old leaves, solitary, about a foot long, round, and smooth. *Umbels* from four to six-flowered with some filamentaceous bodies mixed amongst them. *Spathe* two leaved. *Flowers* large, white, sessile *Tube* of the corol from three to four inches long, three-cornered; border of six equal, regularly disposed, linear-lanceolar, recurved segments, which are about as long as the tube; *apices* acute, and alternately uncinate. *Filaments* nearly as long as the border of the corol, ascending, red. *Anthers* linear. *Germ* inferior, sessile, oblong, polished, seemingly three-celled; *ovula* many, attached to the two margins of the three-receptacles, which are substantially attached to the walls of the *ovarium* and only meet in the centre; for on drying a transverse section, they separate spontaneously from the margins to the centre, and again each of the three has a fissure from the inner angle toward the insertion. *Style* above the tube, incurved, coloured like the filaments, and rather longer than they. *Stigma* three-lobed.

2. C. *asiaticum. Willd.* 2. 45. II. 128

Root an oblong bulb with a fusiform crown. *Stemless. Leaves* sparse, rigidly linear, chanelled, obtuse, jointed; *margins* smooth. *Umbels* from ten to twelve flowered; *flowers* subsessile. *Style* as long as the stamens.

Beng. Sookh-dursun.

Belutta pola taly. *Rheed. Mal. Vol.* 11. *t.* 38.

This plant, which I now consider to be *Crinum asiaticum* of *Linnæus,* may have been the only asiatic species known to him when he wrote his *Flora Zeylanica,* grows on the moist muddy or swampy banks of rivers and is in blossom the greater part of the year, and is no doubt *Rumph.* second species of *Radixtoxicaria. Herb. Am.* 6. *p.* 156. which like ours delights in swampy banks of creeks, &c. where mud abounds.

Root bulbous, with a terminal, stoloniferous, fusiform portion issuing from the crown of the bulb, descending deep into the mud or earth; from the last mentioned portion issue the ramous fibrous roots. *Stem* none. *Leaves* radical, equally disposed on every side, linear, concave, (so much so that a section forms nearly a perfect semicircle,) no keel; *margins* smooth; length from one to three feet, and where broadest little more than three-fourths of an inch. *Scapes* generally shorter than the longer leaves, a little compressed, smooth, often coloured. *Umbels* with from six to sixteen flowers. *Spathe* two-leaved, with filiform bractes amongst the flowers. *Flowers* large, white, subsessile, fragrant during the night. *Corol; tube* cylindric, from four to six inches long, coloured, or pale-green, according to exposure, smooth. *Divisions* of the border linear-lanceolate equally disposed; *margins* waved a little, a recurved process at the apex of each. *Filaments* equally disposed, ascending, upper half coloured. *Anthers* linear, incumbent. *Germ* beneath. *Style* as long as the stamina, declined. *Stigma* simple. *Berry* membranaceous, subglobose, containing in one cell, one or two rugose, bulb-like seeds and although the flowers are subsessile, the capsules are short-peduncled. II. 129

Note. I suspect that two or more, very distinct species have hitherto been included under one specific name; which I have now assigned to the above described, by far the smallest of the two, and no doubt Van Rheede's *Beluta pola tali.* The other, Rumphius's first species of *Radix Toxicaria,* which is the one he has figured, and now called by me *Crinum Toxicarium,* was, I believe, considered by König to be C. *latifolium* of Linn. and was formerly described and figured by me as such.

3. C. *ensifolium. R.*

Bulb ovate. *Leaves* sparse, straight, ensiform.

A native of Pegu from thence introduced by Dr. W. Carey into the Botanic Garden at Calcutta but has not yet blossomed there. In habit it most resembles *Asiaticum* but differs from that species in the shape of the bulb. The leaves also differ, for here they are less channelled, taper more toward the apex which is much shorter; other differences will, no doubt, be found when the flowers appear.

4. C. *brevifolium. R.*

Bulb stemless. *Leaves* rigid, straight, lanceolate, broad, obtuse-pointed, waved, margins smooth. *Umbels* from ten to twelve flowered; *flowers* regular, short-pedicelled. *Segments* of the border equalling the trigonal tube.

This elegant, rather small, very well marked species, has been introduced from the Mauritius into the Botanic Garden at Calcutta where it blossoms during the hot and rainy season.

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Leaves six or eight from each bulb, sparse, straight, spreading a little, lanceolar, broad, obtuse, pointed, margins smooth, from twelve to eighteen inches long, and two and a half or three inches broad. *Scapes* from the axills of the old withered leaves, much compressed, about twelve inches high. *Involucre* two-leaved, from ten to twelve flowered. *Flowers* large, white and faintly fragrant, short-pedicelled. *Tube* slender, about three inches long, trigonal. *Segments* of the border six, linear, recurved, length of the tube. *Filaments* equal, and equally disposed, shorter than the segments of the border. *Anthers* linear, incumbent. *Germ, style,* and *stigma* as in the other species.

5. C. *longifolium. R.*

Bulb spherical, stemless. *Leaves* linear, long, drooping, channelled, margins slightly scabrous. *Umbel* from ten to twelve flowered; *flowers* subsessile.

A native of the interior parts of Bengal where it was found in single plants among grass, and on low inundated ground, by Dr. Carey, and by him introduced into the Botanic Garden at Calcutta, where it flowers and ripens its seed during the rainy season. It comes nearest C. *asiaticum,* but differs much in appearance, and in the size and shape of the bulb. This being a much better looking plant, the bulbous root has not the long spindle-shaped crown of that species, which penetrates deep into the mud on the borders of creeks, where that plant is naturally found.

Root many strong, fleshy fibres, from the crown of a round, tunicated bulb, which penetrate deep into the soil. *Leaves* many, equally disposed in all sides, declinate, tapering regularly from the base to a fine point; general length from two to three feet, including their withered apices, concave, but no keel, margins cartilaginous, and hispid, striated, breadth about two inches at the base. *Scapes* axillary, length various; in low inundated places, sufficiently long to raise the flowers above the water; in the Botanic Garden, on dry ground, always much shorter than the leaves, variously bent, a little compressed, smooth. *Umbel,* with from eight to twelve sessile, large white, fragrant flowers, intermixed with filiform bractes. *Spathe* two-leaved. *Calyx* none. *Corol* and *tube* subcylindric, inside rugose, about four inches long. *Segments* of the border linear-lanceolate, rather shorter than the tube. *Filaments* ascending, coloured, nearly as long as the segments of the corol. *Anthers* incumbent, brown. *Germ* oblong, three-celled, each containing many (from eight to sixteen) ovula attached, or rather immersed in the margin of their vertically oblong parietal receptacles. *Style* as long as the stamina, above the tube coloured. *Stigma* small, three-lobed. *Pericarpium (Berry)* subrotund, from one to two inches in diameter according to the number of seeds, swelled out where the seeds are lodged, crumbling away, or otherwise decaying. *Seeds* from one to eight or ten, shape and size varying according to the number.

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6. C. *lorifolium. R.*

Bulb cylindrically-ovate. *Leaves* very long, thong-shaped, margins scarcely scabrous. *Umbels* with about twenty pedicelled regular flowers.

A native of Pegu, from thence introduced by the Rev. F. Carey, into the Botanic Garden at Calcutta where it flowers about the close of the rains. It has immensely long, weak, recumbent leaves, the breadth of which at the base, the broadest part, is rather under two inches, and the length five feet. The bulbs thrive well, and produce abundance of suckers, by which it is very readily multiplied.

7. C. *Sumatranum. R.*

Stemless. Leaves linear-lanceolate, straight, stiff, channelled, margins hispid. *Umbel* from ten to twenty-flowered, flowers subsessile, regular.

A native of the interior parts of Sumatra, from thence Dr. Charles Campbell sent the plants to the Botanic Garden at Calcutta in 1801, where they thrive well, and blossom at different periods of the year.

II. 132

Root perennial, ovate, with many thick, fleshy, fibres, descending from its crown. *Stem* none, at least scarcely any thing that can be so called has yet appeared after ten years culture. *Leaves* radical, straight, rigid, linear-lanceolate, rather obtusely pointed, concave on the upper surface; smooth on both sides, with their margins whitish, callous and hispid, held between the light and the eye, beautifully striated with double lines, and tessellated with transverse green veins, from three to six feet long, and from three to six inches broad. *Scapes* axillary, solitary, much shorter than the leaves, smooth, a little compressed. *Umbel* from ten to twenty-flowered. *Involucre* two-leaved, with filamentaceous fibres mixed amongst the pedicells. *Flowers* large, white, pedicelled. *Corol; tube* cylindric, about four inches long, divisions of the border linear, as long as the tube, having their apices alternately hooked. *Filaments* ascending, coloured, shorter than the segments of the corol. *Anthers* linear, incumbent. *Germ* inferior, subsessile, scarcely thicker than the tube of the corol, three-celled, in the inner angle of each is a fleshy succulent receptacle in which one, two, or three seeds are found immersed. *Style* shorter than the stamina. *Fruit* the size of a man's fist; cells uncertain, the partitions being obliterated, but the whole contains one, two, or three large, bulbiform seeds, covered with a tender, somewhat fleshy envelope, which does not open in any regular form, but soon decays.

8. C. *canaliculatum. R.*

Stemless. Leaves linearly tapering, smooth-margined, twice the length of the inflorescence. *Umbels,* from thirty to fifty-flowered; *flowers* pedicelled, regular. *Segments* of the border linear, channelled, obtuse, longer than the tube. *Leaves* from eight to fourteen, sparse, linear, tapering near the apex channelled, margins quite smooth; from three to five feet long, and from three to four inches broad. *Scapes* from the exterior axills, solitary, about two feet long, surface smooth, inside flattened, about as thick as a man's thumb. *Umbels* composed of

II. 133

about forty middling-sized, pure white, long-pedicelled, sweetly fragrant flowers. *Tube* of the corol sub-semicylindric, two and a half inches long; *border* of six linear channelled, obtuse, alternately uncinate, recurved segments, which are larger than the tube. *Filaments* scarcely more than half the length of the segments of the border of the corol, ascending towards the point, coloured. *Anthers* linear. *Germ* elevated on pretty long, thick pedicells, and as in the other species, only apparently three-celled, the receptacles being in fact parietal, and only meeting in the centre; *ovula* several, in two vertical rows, attached to the double margin of the receptacle. *Style* above the mouth of the tube, three-cornered, and about as long as the filaments. *Stigma* of minute lobes. Page Carey Ed.

9. C. *superbum. R.*

Caulescent. *Leaves* lanceolate, smooth, margined. *Umbel* of from twenty to thirty, pedicelled flowers; *tube* of the corol equalling the regular border.

A native of the interior forests of Sumatra from thence sent by Dr. Charles Campbell to the Botanic Garden at Calcutta where it thrives luxuriantly, and blossoms at various periods through the year. This is the largest and by far the most beautiful species of *Crinum* I have yet met with, and if the fragrance of its numerous large flowers is taken into the account, it is probably the most desirable of all the liliaceous tribe.

Root of many fleshy, ramous fibres from the rounded base of the stem, for there is sarcely any appearance of a bulb. *Stem* short, in six or seven year-old plants from twelve to eighteen inches high, as thick as a man's leg, or more, invested with the withered sheathes of the leaves, from its base and lower part shoots spring, in such abundance as to render it readily multiplied. *Leaves* sparse, sheathing, lanceolate, straight and smooth, margins also smooth; points blunt, deeply concave on the upper surface; held between the eye and the light they are beautifully striated with numerous, simple, straight, longitudinal lines, and between these, tessellated with transverse, green veins; from three to six feet long, and from three to six inches broad about the middle, which is the broadest part. *Scape* from the stem immediately below the leaves about three or four feet long, much compressed, particularly on the inside, and about as thick as a man's thumb. *Umbel* from twenty to thirty-flowered. *Involucre* of two large, long, cordate, reflexed, coloured exterior leaves; with numerous filaments mixed among the flowers. *Flowers* very large, pedicelled, rose-coloured, delightfully fragrant; *tube* obscurely three-sided, about five or six inches long, deeply coloured; *segments* of the border equally disposed, linear-lanceolate, revolute, as long as, or longer than the tube, deep rose colour on the outside, pale pink within, apices alternately uncinate. *Germ* inferior, oblong, three-celled, with a few *ovula* in each, attached to a fleshy receptacle, which appear to originate in the centre, from the axis, but their real insertion is into the walls of the *Germ*. *Style* declinate, the length of the deeply coloured, equally incurved, slender filaments. *Stigma* small, perforated, and obscurely three-lobed. II. 134

The ripe seed vessel has not yet been found; they have continued abortive in Bengal.

9. C. *toxicarium. R.*

Caulescent. *Leaves* sparse, lanceolar. *Flowers* pedicelled, numerous, even as far as sixty in a hemispheric umbel. *Capsules* with one or more bulbiform seeds.

Crinum asiaticum. Bot. Mag. N. 1073, has the exact leaf of this species.

Radix toxicaria. *Rumph. Amb.* 6. *var.* 1*st. p.* 155. *t.* 69. II. 135

Beng. Bura-kanoor.

Cing. Tolabo.

I have only found it in gardens; where it is indigenous I cannot say, in Ceylon I believe. *Flowering* time the wet season, though more or less the whole year.

Stem short, but distinct, and stout. *Leaves* linear-lanceolar, very smooth; *margins* most entire; under side elegantly striated length-ways with deeper and lighter green; from three to four feet long, and from five to seven inches broad. *Scapes* axillary, shorter than the leaves, smooth, a little compressed, as thick as a man's thumb. *Flowers* numerous, often fifty, growing in a hemispherical umbel, white, almost inodorous. *Spathe* two-valved, with filiform bractes mixed among the flowers. *Stigma* small, entire, three-sided. *Berries* roundish, the size of a large pigeon's egg, smooth, crowned with the lower part of the remaining tube of the corol, seldom more than one-celled, without any natural opening, and containing one or more large, bulb-like, rugose, firm fleshy seeds; though in the germ there are the rudiments of three cells with many seeds in each.

Its immense large, beautiful, smooth, deep green leaves, make it conspicuous and desirable in the Flower Garden.

This plant has hitherto been blended with *Crinum asiaticum*, though no two species of liliaceous plants, of the same genus, can be more strongly marked, not only by the size, shape of the leaves, and number, &c. of the flowers in the umbel, but still more strongly by Toxicaria, being caulescent; and the other most perfectly destitute of every appearance of a stem. It ought to be compared with Willdenow's *Crinum bracteatum.*

10. C. *nervosum. Willd.* 2. 47.

Leaves reniform-cordate, many-nerved. *Spathes* many flowered. II. 136

Cepa sylvestris. *Rumph. Amb.* 6. *p.* 160. *t.* 70. *f.* 1.

Pancratium *amboinense. Willd.* 2. 45.

Introduced from Amboyna into the Company's Botanic Garden at Calcutta, where it blossoms in May and June, but rarely ripens its seeds.

Root bulbous, perennial. *Leaves* radical, petioled, reniform-cordate, many-nerved, entire, smooth on both sides; length and breadth nearly the same, and in healthy luxuriant plants about ten or twelve inches each way. *Petioles* smooth, deeply channelled. *Scape* erect,

Page Carey Ed. *Spathes* three, many (from thirty to fifty) flowered. *Flowers* pedicelled, large, pure white, and fragrant. *Bractes* chaffy, intermixed amongst the pedicells of the flowers. *Corol* infundibuliform. *Tube* slender, straight; divisions of the border shorter than the tube, alternately lanceolate and cuneiform. *Filaments* inserted by broad, lobate, sometimes united, fleshy bases, into the mouth of the tube of the corol, rather shorter than its divisions. *Anthers* incumbent. *Germ* beneath, three-celled, with two seeds in each, attached to the inner angle of the cell. *Style* rather longer than the stamens. *Stigma* simple, acute. *Berry* as in the other species but smaller, and with rarely more than one bulbiform seed.

Sect. I. *Flowers declinate.*

11. C. *augustum R.*

Bulb columnar, mostly above ground. *Leaves* sparse, lanceolate, channelled, smooth-margined. *Scapes* lateral, the length of the leaves; *umbels* of from twenty to thirty, pedicelled, declinate flowers.

From the Mauritius this magnificent plant has been introduced into the Botanic Garden at Calcutta, where it blossoms at various times throughout the year, but with the
II. greatest luxuriance during the rains; the scapes are as thick as a child's wrist, above
137 three feet long, and of a dark, reddish purple colour, the umbels have then about thirty sweetly fragrant, rosy flowers, on pedicells from one to two inches long; and coloured like the scape; *tube* of the corol from four to five inches long, colour a lighter purple; *segments* of the border lanceolar, six inches long; *filaments* and *style* purple, declinate, with the incumbent *anthers* yellow. This is the only species known to me with any thing like a stem, and declinate flowers, nor can I reconcile it with any one of the many species of *Crinum* or *Amaryllis* hitherto described in any book that I have met with.

12. C. *latifolium. Sp. pl.* 419.

Bulb spherical, stemless. *Spathes* many, from ten to twenty-flowered. *Flowers* sessile, declinate, with an obliquely campanulate border. *Leaves* lanceolate, margins scabrous.

Amaryllis *latifolia. Willd.* 2. 57.

Sjovanna-pola-tali. *Rheed. Mal.* 11. *t.* 39.

Amaryllis ornata. *Bot. Mag. N.* 923, agrees so well with this as to induce me to think they are the same, or only varieties of one species.

A native of Bengal where it begins to blossom with the first showers in April, and continues to do so during the early part of the rainy season.

I long considered this most stately plant, a variety of C. *Zeylanicum*, but on taking up some of the bulbs of both sorts to send to England, I observed a greater difference in their appearance, than can be traced in the parts above ground, though even their disagreements are sufficiently conspicuous to justify the separation. The following description will be found more comparative than usual with me, on account of their resemblance and no doubt both be-
II. long to *Crinum*, at least to the same genus, with our East India Crina. I do not therefore
138 think L. Heritier, and after him Willdenow, have rendered Botany any service by changing the place of C. *Zeylanicum* and *latifolium*.

Root a spherical, tunicated bulb, often two feet in circumference and rather more flattened at the base, than on the opposite end. In C. *Zeylanicum* it is ovate, never so large and abounds more in cobweb-like fibres. *Leaves* numerous, radical, disposed equally on all sides, lanceolate, waved, smooth, tapering slowly from within a few inches of the base to rather a broad and obtuse point; *margins* scabrous, with minute, cartilaginous denticuli, length from one to three feet, and from three to five inches broad; in *Zeylanicum*, they are much narrower, the rib much more prominent, the length as much as three feet, the margins much more waved, and perfectly smooth; this mark alone is sufficient to distinguish the two plants. *Scapes* from the axills of the decayed leaves, somewhat compressed, as thick as a man's thumb and from twelve to twenty-four inches long; in *Zeylanicum* it is longer, and coloured. *Umbels* with from ten to twenty flowers; in *Zeylanicum* rarely so many; *spathes* (in both) two, of an ovate, conic form, with many soft *filaments* mixed amongst the flowers. *Flowers* sessile, large, tube green; *border* very pale rose, almost white, faintly fragrant, particularly when they first expand soon after sunset. In *Zeylanicum* they are scarcely so large, and the colours are much more bright, almost like Amaryllis vittata. *Corol; tube* declinate, cylindric, obscurely three-sided, about four inches long. *Border* campanulate, horizontal; *segments* lanceolar, with rather soft, subulate points; length between three and four inches. *Filaments* six, shorter than the *segments* of the border of the corol, inserted on the mouth of the tube, declinate, with apices sharp, and always erect. *Anthers* falcate, incumbent and tremulous, pale yellowish grey.
II. In *Zeylanicum* they are brown. *Germ* inferior, oblong, three-celled, with several *ovula* in each
139 attached in two vertical rows, to the two lobes of the thick fleshy receptacles, which are substantially united to the wall of the germ, and only *seemingly* so to each other in the *centre*. C. *Zeylanicum* and our other Indian *Crinums* have exactly the same germ, and all produce large bulbous seeds. *Style* filiform, declinate, projecting beyond the stamina. *Stigma* small, three-toothed. *Pericarpium; berry*, as in the plants quoted in the last paragraph, a soft somewhat fleshy perishable envelope which covers one, two, or three, rarely more large, fleshy, bulbiform seeds; no trace of either partitions or stutures to be found.

13. C. *zeylanicum. sp. pl.* 321. *Syst. veg. Murr.* 318, *&c.*

Bulbs ovate, stemless. *Spathes* many, from ten to twelve flowered. *Flowers* sessile, declinate with a long recurved tube, and oblique, campanulate border. *Leaves* linear-lanceolate, keeled, much waved, drooping; *margins* smooth.

Beng. Sookh durshun.

Page Carey Ed.

Tulipa Javanica. *Rump. Amb.* 5. *t.* 105.

Amaryllis *lineata. Lamarck Encycl.* 1. 123.

A. *zeylanica. Willd.* 2. 56.

A. *ornata. Bot. Mag.* 1171.

Grows wild on low, rich, uncultivated ground, and generally on the banks of rivers and water courses. Flowers first in May, and continues doing so during the rainy season.

Spathes two-leaved with linear membranaceous bractes amongst the flowers. *Corol; tube* very long, recurved. *Berries* and seeds exactly as in the other species.

Note. When the plant is suffered to remain some years in the same place, it multiplies so much, as to throw the bulbs nearly even with the surface of the earth, and then they appear to have stems, which are formed by the concentric sheathes of the leaves, as in the more perfect caulescent species.

II. 140

Crinum giganteum, Andrew's Bot. Rep. 169, has lately been introduced from the Mauritius, into the Botanic Garden at Calcutta, where it grows luxuriantly, and blossoms with the other species, in May, and during the rains. It has almost the exact flowers of my C. *latifolium*, with nearly the leaves of this species, only rather longer, and narrower, margins more waved as in *Amaryllis spectabilis, N.* 390. of the same work, curled, and *scabrous;* in *Zeylanicum* they are smooth.

14. C. *moluccanum. R.*

Bulbs spherical; stemless. *Spathes* from four to six-flowered; *flowers* sessile, declinate; tube recurved, equalling the lanceolar segments of the border. *Leaves* linear-lanceolate, waved, reclinate; *margins* scabrous.

This most elegant, rather small species, was introduced from Amboyna, into the Botanic Garden at Calcutta in 1798, where it blossoms during the rainy season, generally in July and August.

AMARYLLIS. Schreb. gen. n. 554.

Corol hexapetala, irregular. *Filaments* from the mouth of the tube, declinate, unequal in proportion, or direction.

1. A. *radiata. Willd.* 2. 60.

Spathe two-parted, many-flowered. *Flowers* pedicelled; *tube* short; divisions of the border unilateral, linear, waved, revolute. *Stamina* and *Style* ascending, longer than the corol.

Chin. Yuk-lan.

A native of China, blossoming during the rainy season in the Botanic Garden at Calcutta.

2. A. *aurea. Willd.* 2. 57. *Bot. Mag.* 409. II. 141

Spathe from six to eight flowered; *flowers* short-pedicelled, declinate; *segments* of the border linear, revolute, and waved. *Leaves* linear.

A native of China; from thence introduced into the Botanic Garden at Calcutta, where it blossoms about the close of the rainy season.

ALLIUM. Schreb. gen. n. 557.

Spathe many-flowered. *Umbels* collected. *Corol* six-petalled, expanding. *Capsules* superior, three-celled.

1. *tuberosum. R.*

Root tuberous. *Scape* naked, nearly round, having only a ridge on one side. *Leaves* linear, flat. *Umbels* fastigiate; capsule-bearing.

Beng. Bunga-gundeena.

This plant I find cultivated about Calcutta by the Hindoos, yet I cannot well reconcile it with any species hitherto described. It grows in large tufts, like *A. schoenoprasum*, or cives.

Root tuberous, perennial, with numerous long, white, fleshy fibres. *Leaves* radical, united for an inch or two, by means of their sheathes, into something like a short stem, above the sheathes they are linear, somewhat twisted, a little concave on the upper side, and convex underneath, smooth, about half the length of the scapes. *Scapes* naked, rising amongst the leaves, suberect, round, with a pretty sharp ridge on one side, tapering from the base. *Umbel* fastigiate, crowded. *Spathe* single, membranaceous, withering. *Petals* oblong, acute. *Stamens* equal, simple, shorter than the petals.

The Hindoos use it as an article of diet as leeks are used in Europe, and other countries.

2. A. *Porrum. Willd.* 2. 64.

Stem flat-leaved. *Umbel* bearing. *Stamens* three-pointed. *Root* coated. II. 142

Beng. Gundeena.

Pers. Gundana.

Arab. Koonass.

3. A. *sativum. Willd.* 2. 68.

Stem flat-leaved. *Umbel* bulbiferous. *Bulb* compound. *Stamens* three-pointed.

Sans. Lusoona, Mahoushudha, &c.

Beng. Lusoon, but generally pronounced Rusoon.

Pers. Seer.

4. A. *cepa. Willd.* 2 80.

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Scape naked, gibbous near the base, longer than the columnar leaves.

Arab. Besel, or Bassul.

5. A. *ascalonicum. Willd.* 2. 75.

Biennial. *Scape* naked, round, a little swelled below, and longer than the sub-columnar leaves. *Umbels* round, many-flowered. *Stamens* alternately swelled at the base. *Petals* equal, expanding, shorter than the stamens.

Beng. Peeaj.

Sans. Pulandoo.

This very useful *onion*, is much cultivated in India during the latter part of the rains, and the cool, dry months of October, November, December, January, and February, by planting the smaller bulbs, and offsets, or by the seed. The dry roots are universally sold in every market over India, and form a very considerable part of the diet of the natives. The general price in Calcutta is about two shillings the hundred weight.

Root biennial, or more, consisting of a fascicle of several ovate oblong bulbs, generally (as found in the markets,) about as large as the first joint of the middle finger. *Leaves* some-
II. what bifarious, fistulous, more than semicylindrical, tapering, pointed, compressed toward the
143 apex, smooth and shorter than the scapes. *Scapes* rising from the centre of the short stem formed by the united sheathes of the leaves, naked, round, smooth, slightly swelled towards the base and from thence tapering to the umbel, from one to two feet long. *Sheathes* shorter than the umbel, irregularly bursting into two or three subovate segments. *Umbels* globular, as much as two hundred-flowered. *Flowers* like those of the common onion, *(Cepa.)* *Petals* equal, expanding, shorter than the stamens, white, with a green keel. *Filaments* erect, alternately dilated at the base. *Anthers* ovate, green.

GLORIOSA. Schreb. gen. n. 561.

Calyx none. *Corol* six-petalled reflex. *Germ* superior, three-celled. *Cells* many-seeded, *attachment* central. *Style* oblique. *Capsule* three-celled, three-valved. *Seeds* several. *Embryo* double, furnished with a perisperm.

1. G. *superba. Willd.* 2. 95.

Root bulbous, biennial. *Stem* herbaceous. *Leaves* lanceolate, ending in a tendril.

Mendoni. *Rheed. Mal.* 7. *t.* 57.

Hind. Cariari.

Beng. Ulat-chandal. Eesha langula.

Native of forests of India; it appears during the rainy season in Bengal, and is one of the most ornamental plants any country can boast of; the root is said to be a violent poison.

CURCULIGO. Gort.

II. *Calyx* none. *Corol* superior, pedicelled or sessile; border six-parted. *Germ* three-
144 celled. *Cells* many-seeded; *attachment* central. *Capsule* veined, one-three-celled. *Seeds* few. *Embryo* cylindrical, radicle centripetal; *perisperm* ample.

1. C. *orchioides, Gært. Sem.* 1. 63. *Willd.* 2. 105. *Corom. pl.* 1. *n.* 13.

Polygamous. *Leaves* linear-lanceolar, plaited; *apices* viviparous. *Corol* long-pedicelled.

Nela pana kelangu. *Rheed. Mal.* 12. *t.* 59. *good.* Orchis amboinica major. *Rumph. Amb.* 6. *t.* 54. *f.* 1.

Teling. Nanla, Tadee.

A native of shady, uncultivated places about Samulcota, though by no means common; in my garden it flowers all the year round.

Root perennial, tuberous, with many fleshy, vermicular, fibres spreading in all directions. *Stem* none. *Leaves* numerous, radical, petioled, narrow-lanceolar, nerved, slender, when young there are a very few soft white hairs on them; from six to eighteen inches long, and from half an inch to an inch broad, their apices are viviparous, whenever they rest on the ground for any length of time. *Petioles* channelled, below sheathing, so as to embrace those within. *Racemes* solitary, axillary, two-ranked, with their apices just appearing above the earth. *Peduncles* compressed, clavate, about an inch long. *Bractes* one-flowered, below remote, above nearer, spathiform pointed, decreasing in length towards the top, so that the apices of the whole are nearly horizontal, (corymbiform). *Flowers* pretty large, yellow, the one or two lowermost are HERMAPHRODITE, above, all are male.

HERMAPHRODITE. *Calyx* none. *Corol* one-petalled, the border elevated above the soil on a long, slender, villous imperforated pedicel; *segments* of the border six, lanceolate, spreading, hairy on the outside. *Filaments* six, very short, inserted on the base of the seg-
II. ments of the border of the corol. *Anthers* linear, erect. *Germ* inferior, sessile, lanceolate,
145 three-celled, with several ovula in each, attached to the axis. *Style* very short. *Stigma* large, tapering, apex more or less three-cleft. *Capsule*, when a germ, it shows three-cells, with the rudiments of six or eight seeds in each, but when the seeds are ripe, the number is only from one to four in the whole, and they seem as if in a transparent, fleshy, one-celled capsule, separated by a spongy substance. *Seeds* from one to four, shining black, beaked. *Male peduncle, corol,* and *stamens* as in the hermaphrodite; no *germ, style,* or *stigma.*

Note. It is a plant of no great beauty, nor are its flowers fragrant; variety alone must recommend it to a place in the Flower Garden.

2. C. *recurvata. R.*

Leaves lanceolar, plaited. *Raceme* globular, recurved. *Corol* sessile, rotate. *Capsule* bacciform, round, many-seeded. Page Carey Ed.

It is a native of the eastern frontier of Bengal, from thence received into the Botanic Garden at Calcutta, where it blossoms, and ripens its seed the whole year round.

Root perennial, consisting of many fleshy fibres proceeding from a tuberous, stoloniferous body. *Stem* none. *Leaves* radical, petioled, lanceolar, recurved, plaited, entire, smooth on both sides, from one to three feet long, and from two to six inches broad. *Petioles* deeply channelled, one-third, or one-fourth the length of the leaves. *Scapes* axillary, about as long as the petioles, compressed, villous, apex recurved. *Racemes* solitary, strobiliform drooping. *Bractes* spathiform, solitary, singly one-flowered, villous, tapering, about as long as the pedicells and flowers taken together. *Flowers* hermaphrodite, yellow, expanding three quarters of an inch. *Calyx* none. *Corol* superior, sessile, rotate, six-parted. *Segments* lanceolate, spreading, villous on the outside, smooth and yellow, on the inner persistent. II. 146
Filament short, inserted on the short tube of the corol. *Anthers* linear, erect, adhering to each other as in the syngenesious tribe. *Germ* obovate, hairy, three-celled, with many ovula in each, attached to the axis. *Style* longer than the stamens. *Stigma* dilated, subtrilobate. *Capsule* berried, inferior, ovate, the size of a large pea, soft, and clothed with hairs, not opening, three-celled with several seeds in each, arranged in two or three vertical rows, and attached to the axis. *Seeds* round, the size of a small grain of black pepper, and like it black, and wrinkled. *Integuments* two; exterior hard, thick, red, and brittle; inner, a brown membranaceous crust. *Perisperm* conform to the seed, cartilaginous, pale blue. *Embryo* simple, cylindric, straight, penetrating from the umbilicus more than half through the perisperm, (centripetal.)

3. C. *sumatrana. R.*

Leaves broad-lanceolar, plaited. *Spike* half hid in the earth. *Corol* pedicelled. *Stigma* three-lobed.

Involucrum. *Rumph. Amb.* 6. 114. *t.* 53.

A native of the mountains of Sumatra, and from thence sent by Dr. Campbell to this Garden in 1800, where it blossoms in March and April.

Root stoloniferous, perennial. *Stem* none. *Leaves* radical, few, petioled, lanceolar, recurved, plaited, above smooth, somewhat woody underneath, entire, about nine inches long, and about three broad. *Petioles* deeply channelled, from three to four inches long, smooth. *Spikes* strobiliform, mostly hid in the earth, the points of the bractes, and flowers only are visible. *Bractes* ovate-lanceolate, hairy, one-flowered, shorter than the pedicels of the corols. *Flowers* yellow, the lower *hermaphrodite*, while those that occupy the crown of the spike, and of course expand last, are generally *male*. *Calyx* none. *Corol* flat, elevated above the germ, on an erect, hairy columnar pedicel; *segments* six, lanceolate, united at the base, withering. *Filaments* six, short, inserted on the united segments of the corol. *Anthers* erect. *Germ* flask-shaped, villous, three-celled, with many ovula in each, attached to the axis. *Style* crooked, shorter than the petals. *Stigma* enlarged with three small lobes. II. 147

SCILLA. Schreb. gen. n. 567.

Calyx none. *Corol* six-petalled, spreading, deciduous. *Filaments* filiform.

1. S. *indica. R.*

Bulb tunicated. *Leaves* narrow and taper from the base. *Racemes* simple, longer than the leaves. *Flowers* remote, solitary, long-pedicelled, drooping.

A native of the sandy shores of various parts of India. Flowering time the month of March and April.

Root a round, white, perennial, tunicated bulb, about the size of a large apple. *Leaves* numerous, radical, sub-bifarious, ensiform, nearly flat, smooth on both sides, from six to eighteen inches long. When in blossom the plant is perfectly destitute of leaves. *Scape* erect, round, smooth, naked; including the raceme from two to three feet long. *Raceme* very long, erect. *Flowers* remote, long-pedicelled, drooping.

The taste of the root is fully as nauseous, and bitter as that of *Scilla maritima*, and may be possessed of the same qualities.

2. S. *coromandeliana. R.*

Leaves linear, rather acute, deeply channelled. *Racemes* erect, longer than the leaves, bearing from four to eight, remote, long-pedicelled, drooping flowers. Inner petals straight, and bearded at top.

A native of the sand hills of the Coast of Coromandel. In the Botanic Garden at Calcutta it blossoms in May, at which period the plant is perfectly destitute of leaves, nothing but the straight very slender scape, and raceme is to be seen. II. 148

Root a round, tunicated, perennial, greenish-white bulb, of about an inch and a half in diameter. In taste it is exceedingly nauseous, and bitter, and is in India sometimes used as a substitute for the officinal squill. *Scilla maritima. Leaves* linear, rather acute, smooth, deeply channeled; generally six or eight inches long, and less than half an inch broad, even when spread flat. *Scape* straight, erect, naked, smooth, and slender; whole height, raceme included, from twelve to eighteen inches; and not thicker than a crow quill. *Flowers* from four to eight, remote, long-pedicelled, drooping, colour a mixture of dull green, and still duller white, with a slight purple tinge. *Bractes* small, caducous. *Petal* oblong, and nearly of the same size, the inner three with bearded apices. *Filaments* six, equal, inserted on the base of the petals, clavate. *Germ* ovate-oblong. *Style* a three-sided, inverted cone with a triangular opening at top, for the *stigma*.

Page Carey Ed.

ASPHODELUS. Schreb. gen. n. 569.

Corol six-parted. *Nectary* six-valves covering the genitals.

1. A. *clavatus. R.*

Annual. *Stem* naked, ramous. *Leaves* erect, straight, cylindric, fistulous. *Filaments* clavate above their nectarial ciliate base.

A native of the interior parts of Bengal, where it appears to blossom, and ripen its seed during the cold season.

II 149 It seems, from the descriptions and figures in my possession of A. *fistulosus* to be very nearly allied to it. In this the leaves are perfectly straight, and upright, tapering to a long fine point, and as completely fistulous as in the *Onion.* The filaments are nearly of equal lengths, and as much contracted immediately above their expanded ciliate base, and swell much toward the apex. The *petals* are white, with a brown line along the centre.

ANTHERICUM. Schreb. gen. n. 570.

Calyx none. *Corol* beneath, six-petalled, expanding. *Capsule* ovate.

1. A. *uniflorum. R.*

Bulb ovate. *Scape* simple, straight, one-flowered. *Leaves* linear, channelled; *stamina* smooth. *Style* scarcely any. *Stigma* three-cleft.

A native of Rohilkhund, from thence introduced into the Botanic Garden at Calcutta, by Mr. A. Gott, where it blossoms during the cold season.

Bulb ovate, from its base spring many fleshy fibres, some of which support a pendulous oval tuber. *Leaves* two, from the crown of the bulb, and generally two, remote from each other, on the lower half of the scape; all are linear, channelled, equalling in height the scape itself. *Scape* erect, round, smooth, about a foot high, supporting on its apex one, large, pure white flower. *Petals* broad-lanceolate, spreading. *Filaments* short, broad, and smooth. *Anthers* linear, erect. *Germ* oblong, obtusely three-sided. *Style* scarcely any. *Stigma* three-cleft; *lobes* recurved.

2. A. *tuberosum. R.*

Root tuberous. *Leaves* radical, waved. *Scape* ending in an oblong panicle. All the *stamens* subulate.

Sans. Chitra, also Vrishna.

Teling. Kushellee.

A native of the moist vallies up amongst the Circar mountains. Flowering time the II. rainy season.

150 *Root* perennial, consisting of many, fleshy, round fibres ending in small, oblong tubers. *Leaves* radical, many, ensiform, margins waved, smooth, from one to two feet long; and from two to four inches broad. *Scapes* round, smooth, naked, from one to three feet long. *Panicles* oblong, erect. *Flowers* numerous, sub-erect, pure white, about the size and appearance of the snow-drop. *Filaments* equal, simple, short, ascending. *Anthers* linear, erect. *Style* ascending, projecting rather beyond the anthers. *Stigma* lobed. *Capsule* three-sided.

I have had many of the plants in my garden for several years; they are very beautiful when in blossom, and have a long succession of flowers.

ASPARAGUS. Schreb. gen. n. 573.

Calyx none. *Corol* beneath, six-petalled. *Germ* superior, three-celled; *cells* few-seeded; *attachment* interior. *Berry* three-celled, one or two-seeded. *Embryo* serpentine, transverse, on the exterior side of an ample perisperm, opposite to the umbilicus.

1. A. *officinalis. Willd.* 2. 150.

Stems herbaceous, columnar, erect. *Leaves* bristly. *Stipules* in pairs.

Pers. and *Hind.* Nak-doun.

Beng. Hilyoon.

Arab. Hulyoon.

Found as in Europe, in a cultivated state only.

2. A. *acerosus. R.*

Herbaceous, erect. *Thorns* solitary, recurved. *Leaves* three-fold, three-sided, acute, II. polished, permanent. *Racemes* lateral.

151 A native of the interior parts of Bengal. Flowering time the close of the rains, and the beginning of the cold season; seed ripe in December.

Root perennial, composed of many, fusiform, succulent tubers. *Stems* erect, flexuous, round. *Branches* numerous, alternate, expanding, when old round, while young angular. *Bark* smooth, and green on the young parts; on the old, a little ferruginous. *Thorns* solitary, under the branches; *branchlets* and leaves, recurved, strong, and sharp. *Leaves* three-fold, acerose, three-sided, polished, acute. *Stipules* solitary, between the three leaves, branch, or branchlet and thorn triangular, scariose, permanent. *Racemes* lateral, generally solitary, simple, and short. *Flowers* pure white, delightfully fragrant. *Petals* equal, at first expanding, afterwards recurvate. *Filaments* five, incurved, inserted on the petals considerably above their insertion, and shorter than them *Germ* three-lobed. *Style* short. *Stigma* three-cleft, with lobes recurved. *Berry* nearly round, about the size of a pea, rarely more than one of the lobes of the germ comes to maturity, and in that case it is enlarged a little on one side, with the two abortive lobes, smooth, when ripe red, one-celled. *Seed* single, spherical, attached to the axis, which is now on one side by the abortion of two of the lobes of the germ. *Integu-*

ment, a single lucid, somewhat dotted, black crust, adhering firmly to the perisperm. *Perisperm* conform to the seed, horny, greenish-white. *Embryo* slender, equally thick on every part, white, arched in a large semicircle round the circumference of the seed most remote from the umbilicus. Page Carey Ed.

A charming shrub, and easily distinguished by its acerose three-fold, three-sided, polished, acute, permanent leaves.

3. A. *racemosus. Ed. sp. Willd.* 2. 152. II. 152

Shrubby, scandent. *Thorns* solitary, recurved. *Leaves* fascicled, incurved, channelled on the back. *Racemes* thoru-axillary over the ligneous branchlets.

Sans. Suta-moolee.

Hind. Sada-bori.

Beng. Sut-mooli.

A native of various parts of India. Flowering time the cold season, when it perfumes the air to a considerable distance with the delightful fragrance of its flowers; seeds ripe in March.

Root consisting of many, fusiform, smooth, perennial tubers. *Stems* scandent, slender, woody smooth; *young shoots* striated. *Thorns* solitary, recurved, short, strong and sharp. *Leaves* fascicled, filiform, incurved, three-sided. *Racemes* generally simple, often crowded together in the axills of the thorns, over the slender woody branchlets. *Bractes* cordate, and scariose, several about the base of the raceme, they are one-flowered. *Pedicells* diverging, jointed at the middle, one-flowered. *Flowers* very numerous, small, pure white. *Petals* oblong, reflexed. *Filaments* incurved, rather shorter than the petals. *Anthers* purple. *Germ* superior, three-lobed, three-celled, each containing about four ovula, attached to the axis. *Style* short. *Stigma* three-cleft. *Berry* three-lobed, two are generally small, and abortive; when ripe red, and covered with a small portion of pulp. *Seeds* solitary, black. *Embryo* transverse, and curved in a serpentine manner in the back of an ample, hard perisperm, nearly opposite to the umbilicus.

4. A. *curillus. Buch.*

Herbaceous, leaning. *Thorns* solitary, recurved. *Leaves* tern, three-sided, acute, incurved. *Racemes* lateral, few-flowered. *Flowers* long-pedicelled. *Petals* cuneiform, expanding.

A native of Nepal, from whence Dr. Buchanan sent seeds thereof to the Botanic Garden at Calcutta, where it about two years, the plants blossomed in July for the first time, and continue so to do, and to ripen their seeds in January. II. 153

Root perennial. *Stems* weak, diffuse, leaning much, or scandent in a favorable soil and supported; flexuose, round and smooth, very ramous. *Branches* expanding, angular. *Thorns* solitary, recurved, acute, *Leaves* tern, three-sided, incurvate, acute, smooth, tapering toward both sides. *Racemes* lateral, and generally one on each side of a small branchlet, short, bearing a few, remote, long-pedicelled, small white flowers. *Pedicels* jointed, swelled, and bracted at the middle. *Bractes* tapering, membranaceous, two at the base of each pedicel, and one at or near the middle. *Filaments* inserted on the petals above the base, incurved. *Germ* turbinate. *Style*, short. *Stigma* of three, recurved lobes. *Berry*, size of a pea, three-lobed, when ripe red.

5. A. *adscendens. R.*

Herbaceous, erect. *Thorns* solitary, straight. *Leaves* fascicled, cylindric, straight. *Racemes* lateral, simple or compound. *Berries* pendulous.

This very elegant species, is a native of Rohilkund; from thence Mr. A. Gott sent seeds to the Botanic Garden at Calcutta in 1804, and in November 1807, the plants began to blossom, and ripened their seeds in February.

Root perennial. *Stems* round, and slender, yet in general nearly straight and erect. *Bark* smooth, ash-coloured. *Branches* round, diverging, with their extremities ascending. *Thorns* solitary, straight, slender, and acute. *Leaves* numerous, fascicled, cylindric, filiform, smooth, permanent. *Racemes* lateral, at the insertions of the branches and branchlets, solitary, or one on each side, the former, often compound. *Flowers* small, pure white, supported on diverging, slender, jointed pedicells. *Petals* six, distinct at the base, oblong, first expanding, afterwards reflexed. *Germ* turbinate, three-lobed, three-celled, with about six seeds in each, in two vertical rows. *Style* three-grooved. *Stigma* three-cleft. *Berry* pendulous, size of a pea, three-lobed; and as I have constantly remarked that two of the lobes are abortive, its shape is obliquely obovate, smooth, when ripe red, and succulent. *Seed* single, round, attached to the axis, which is now much to one side, by the abortion of two of the lobes of the germ. *Integument* single, lucid, black. *Perisperm* conform to the seed, pure white, cartilaginous. *Embryo* serpentine, lateral. II. 154

FLAGELLARIA. Schreb. gen. n. 614.

Calyx three-leaved. *Corol* three-petalled. *Germ* superior, three-celled. *Cells* one-seeded, attachment superior. *Berry* superior, one-seeded. *Embryo* in the base of the perisperm.

F. indica. Willd. 2. 263.

Teling. Poindee-pootee.

Beng. Bun-chumda.

Hind. Harcharrul.

Panamba-valli. *Rheed. Mal.* 7. *t.* 53.

Sirioides. *Rumph. Amb.* 5. *t.* 29. *f.* 1.

Page Carey Ed. A long, straggling, scandent, perennial plant; a native of forests. Flowers during the beginning of the rains in June.

Calyx three-leaved; *leaflets* unequal, one or two being broader, and emarginate. *Petals* three, oblong, alternate with the leaflets of the calyx, and of nearly the same size. *Anthers* linear, cleft at each end. *Germ* superior, three-celled, one ovula in each, attached to the top
II. of the axis. *Styles* three, shorter than the stamens. *Stigma* simple. *Berry* globular, size
155 of a large pea, smooth, red, pulpy, generally one-seeded, though there is always the rudiments of three.

DRACÆNA. Schreb. gen. n. 574.

Calyx none. *Corol* six-parted, erect. *Filaments* somewhat thicker in the middle. *Germ* superior, three-celled, cells one-seeded; attachment interior. *Berry* three-lobed, with one seed in each (generally one or two of the lobes abortive.) *Embryo* near the base of the perisperm on the outside.

1. D. *angustifolia. R.*

Shrubby. *Leaves* stem-clasping, linear, acute, drooping, waved, smooth. *Panicle* terminal, *flowers* fascicled.

Terminalis angustifolia. *Rumph. Amb.* 4. *t.* 35.

A native of Amboyna, and from thence introduced into the Botanic Garden at Calcutta in 1798. Flowering time in Bengal, the hot season; seed ripe in September and October.

Root ramous. *Stem* erect, as thick as a stout walking cane; ramous, marked with the oblique cicatrices of the fallen leaves; whole height, when in blossom, eight or ten feet. *Leaves* crowded about the top of the plant, stem-clasping, linear, acute, drooping; *margins* waved, entire, smooth on both sides; from twelve to eighteen inches long, and under two in breadth. *Panicles* terminal, ovate, composed of many somewhat ascending, compound branches. *Flowers* numerous, fascicled, pedicelled, greenish white. *Bractes* small, from one to four-flowered. *Calyx* none. *Corol* one-petalled, permanent, subcylindric, half six-parted, *divisions* linear, on the day of expansion revolute. *Filaments* six, rather shorter than the
II. corol, inserted on the middle of the base of its divisions. *Anthers* incumbent. *Germ* supe-
156 rior, three-sided. *Style* length of the corol. *Stigma* three-lobed. *Berry* from one to three-lobed, pulpy, deep orange colour, each lobe the size of a marrow-fat pea, containing one, large, round, horny seed.

2. D. *ferrea. Willd.* 2. *p.* 157.

Perennial, caulescent, erect. *Leaves* petioled, lanceolate, cuspidate, ferruginous. *Petioles* stem-clasping, and channelled. *Panicle* terminal.

Terminalis rubra. *Rumph. Amb.* 4. *p.* 80. *t.* 34. *f.* 2.

A native of China. In Bengal it blossoms from December until March, but never produces seed.

Stem erect, often as thick as a man's wrist, with few, erect, perennial, round branches marked with the cicatrices of the fallen leaves, height of the plants in Bengal, when eight or ten years old, from six to ten feet. *Leaves* sub-bifarious, petioled, lanceolate, cuspidate, entire, smooth on both sides; while young a lively pink, changing to a deep ferruginous colour, particularly on the upper surface; from one to two feet long. *Petioles* stem-clasping, deeply channelled, from three to six inches long. *Panicle* terminal, composed of several, generally simple, diverging racemes. *Bractes* three-fold, triangular, acute. *Flowers* numerous, short-pedicelled, diverging, pale purple. *Calyx* none. *Corol* one-petalled. *Tube* short, and somewhat gibbous. *Border* of six, oblong, spreading segments; the exterior three deeper coloured. *Filaments* rather shorter than the segments of the corol, and inserted on their base, at the mouth of the tube. *Germ* three-celled, in each many *ovula* in two vertical rows, attached to the axis. *Style* as long as the stamens. *Stigma* three-cleft.

Note. In Bengal this has not ripened its fruit.

3. D. *terminalis. Willd.* 2. 157.

Perennial, caulescent, erect. *Leaves* lanceolate.

Terminalis alba. *Rumph. Amb.* 4. *p.* 80. *t.* 34. *f.* 1.
II. A native of the Moluccas. Flowers about the beginning of the hot season in the Botanic
157 Garden at Calcutta.

4. D. *spicata. R.*

Caulescent. *Leaves* lanceolate, drooping. *Spikes* terminal, *bractes* many-flowered. *Corol* cylindric, at last becoming twisted. *Stigma* three-lobed.

A native of Chittagong, and from thence introduced into this Garden by Dr. Buchanan, where it blossoms in April.

Root fibrous. *Stem* erect, toward the top succulent, perennial, marked with the cicatrices of the fallen leaves, as in the other *Dracæna*. *Leaves* crowded about the extremity of the plant, sheathing, lanceolate, drooping, entire, pointed; smooth on both sides; from six to twelve inches long, and two or three broad. *Spikes* terminal, bent a little to one side; numerous pointed, recurved bractes surround the base, and a few shorter, appressed ones from thence to the flower-bearing position. *Flowers* numerous, sessile, collected in small fascicles, each fascicle having a small, cordate, pointed bracte immediately under it. *Calyx* none. *Corol* one-petalled, cylindric, divided half way down into three exterior, and three interior slender, linear, equal, straight segments; colour pale greenish yellow, as they advance in age the tube becomes twisted. *Filaments* inserted on the base of the segments of the corol, and of their length. *Stigma* three-lobed. *Berry* with from one to three, distinct, round,

and smooth lobes; while immature, a deep olive green, when ripe, deep reddish orange; each lobe containing a single, large, round, smooth, white, horny seed. Page Carey Ed.

5. D. *maculata. R.*

Caulescent, shrubby, weak. *Leaves* oblong, broad-lanceolar, spotted. *Panicles*, terminal, lax; *flowers* solitary. II.

A slender, leaning, shrubby species, from three to four feet in height, a native of Sumatra, from thence introduced, by the late Dr. C. Campbell into the Botanic Garden at Calcutta, where it flowers during the hot months of March and April. The variegation of the colour of the leaves makes it interesting and ornamental. 158

Stems tending to be erect, but from their weak texture, leaning much to one side. *Branches* few, and like the stems; general height of five year old plants, from three to four feet. *Leaves* alternate, approximate, sheathing, from lanceolar to oblong, entire, smooth, strongly marked with circular spots of a deeper, or lighter yellow; from four to eight inches long, and from one to three broad. *Panicles* (in stunted plants *racemes*) terminal; thin, smooth, variously bent. *Flowers* scattered, pedicelled, pretty large, pale greenish yellow. *Bractes* solitary, ensiform, one, rarely two-flowered. *Corol;* tube gibbous; *border* six-parted; *segments* linear, length of the tube. *Filaments* six, inserted on the base of the segments of the border of the corol and of their length. *Anthers* incumbent. *Germ* superior, obovate, three-celled, with one ovula in each, attached to the axis below its middle. *Style* length of the corol. *Stigma* composed of three, roundish, beautiful granulated lobes.

6. D. *cernua. Willd.* 2. 157.

Subarboreous. *Leaves* crowded, sessile, narrow-lanceolar, fine-pointed. *Panicles* terminal, drooping, branches few, divaricate. *Flowers* solitary.

Found by Colonel Hardwicke on the Island of Mauritius, in flower in August and September.

7. D. *umbraculifera. Willd.* 2. 156.

Subarboreous. *Leaves* cuneiform-lanceolar (that is, taper most toward the base,) acute. *Panicles* terminal, sessile, short, with the ramifications and flowers diverging. II.

Found by Colonel Hardwicke at the Mauritius; in flower in July and August. 159

8. D. *terniflora. R.*

Shrubby, erect. *Leaves* lanceolar, petioled. *Raceme* terminal, often panicled; *flowers* tern, pedicelled.

Bunamtol, the vernacular name in Silhet, where it is indigenous amongst the hills which bound that province to the north; there it grows to the height of about eight feet, flowering in February. The seeds take nearly one year to ripen.

Stems slender, nearly erect. *Branches* few and weak. *Leaves* about the extremities of the branches, alternate, approximate, petioled, lanceolar, acuminate, perfectly smooth on both sides, and of a fine texture, slightly marked with many, very fine, scarcely conspicuous, parallel veins, from six to twelve inches long, and, the petiole included, two or three broad. *Petioles* from one to three inches long, stem-clasping, &c. as in the genus. *Racemes* terminal, solitary, rising, curved, often more or less compound, sometimes panicled, nearly as long as the leaves, every part smooth. *Flowers* always in *threes*, pedicelled, delicately slender, colour pale greenish-white. *Pedicels* slender, jointed near the middle, the part below the joint more permanent, and longer than the bractes. *Bractes* an exterior, three-flowered, ovate one, and a smaller within it, to each pedicel; all delicately thin, membranaceous and white. *Calyx* none. *Corol* funnel-shaped; *segments* of the border six, linear, longer than the tube, withering, and becoming spiral. *Filaments* six, from the mouth of the tube, length of the segments: *Anthers* incumbent. *Germ* superior, oval, three-lobed, three-celled, with one *ovula* in each, attached to the lower end of the axis. *Style* longer than the corol. *Stigma* three-lobed. *Berries* rarely more than one of the three lobes of the germ comes to maturity when it is about the size, and appearance of a fine red cherry. *Seed* solitary, conform to the berry, perisperm conform to the seed, horny, as in the palms. *Embryo* simple, lodged in the base of the perisperm on the outside. II. 160

9. D. *atropurpurea. R.*

Shrubby, erect. *Leaves* lanceolar, acuminate, (highly coloured.) *Panicles* terminal; *branches* few, long, simple, and diverging; *flowers* solitary.

Lall Bun-amtol, the vernacular name in Silhet, where it is found wild in the forests, growing to be a tall, scantily branched, caulescent species, with dark purple leaves and inflorescence of from six to eight feet in height; flowering in March and April, and the berries ripening the January following.

Leaves about the ends of the branchlets, short-petioled, lanceolar, acuminate, polished, striated longitudinally with innumerable, fine, parallel veins, colour an enchanting, rather dark ferruginous purple; from six to eight inches long, by one to two broad. *Panicles* terminal, solitary, composed of a few, long, diverging branches toward the base, length of the leaves, colour purple, and particularly dark when young. *Flowers* solitary, on jointed pedicels; the part below the joint permanent, and shorter than the bractes. *Bractes* two to each pedicel; one exterior and larger than the other, inserted on the base of the pedicel laterally, and smaller. *Corol, stamina, pistillum,* and *berries,* as in the genus.

SANSEVIERA. Thunb. prod.

Calyx none. *Corol* six-parted, with the stamina inserted on their base. *Germ* superior, three-celled. *Cells* one-seeded; attachment interior. *Berries* from one to three, united, one-seeded.

161 S. *zeylanica. Willd.* 2. 159. *Corom. pl.* 2. *N.* 184.

Stemless. *Leaves* linear, fleshy, concave, cuspidate. *Racemes* as long as the leaves; *flowers* fascicled. *Berries* drooping, their lobes globular, and slightly united.

Sung. Moorva. *See Asiatick Researches.* 4. 271.

Beng. Moorba, Murahara, Murgalie.

Aletris *hyacinthoides zeylanica. Linn.*

We may call it in English Bow-string Hemp.

Teling. Ishama-coda nar.

Aloe zeylanica pumila, of *Plukenet. t.* 256. *Fig.* 5. is no doubt this plant as is also Katukapel of *Rheed Malabaricus, vol.* 11. *page* 83. *table* 42, so that I conclude the plant in the King's garden at Kew "*Aletris acaulis foliis lanceolatis carnosis, floribus geminatis*" to be the Guineensis, the fruit of which has lately been so well described, and figured by Gærtner, as to enable me with the more certainty to say that our Indian plant is perfectly distinct. It grows very commonly under bushes, in thin jungle (forests,) in almost every soil. Flowering time the cold and the beginning of the hot season, that is, from the beginning of January till May.

Root perennial, stoloniferous. *Stolones* as thick as the little finger, running under the ground, inserted in sheathing scales. *Stem* none. *Leaves* radical, from four to eight, the exterior ones shortest, spreading most, and considerably broader, the interior ones nearly erect, from one to four feet long, semi-cylindric, grooved on the upper side, each ending in a round, tapering, sharp point, they are all coloured with deeper and lighter green, and somewhat striated, but otherwise are smooth. *Scapes* issuing from the centre of the leaves, from one to two feet long, including the raceme, or flower bearing part, erect, round, smooth, about as thick as a small ratan, between the raceme and the base there are at regular distances, four
II. or five pointed, alternate sheaths. *Racemes* erect, about as long as, or longer than, the scape
162 below the flowers, striated, smooth. *Flowers* middle-sized, greenish white, erect, collected in fascicles of from four to six, on little, regularly distant, tuberosities of the rachis. *Bractes* small, membranaceous. *Pedicels* clubbed, short, ascending, one-flowered. *Calyx* none. *Corol* one-petalled, not in the least wrinkled, funnel-shaped, half six-cleft; *divisions* nearly linear. *Filaments* length of the divisions of the corol, and inserted into the base. *Anthers* linear-oblong incumbent, half two-cleft. *Germ* three-lobed, three-celled, each containing a single *ovula*, attached to the axis. *Style* length of the stamens. *Stigma* three-sided, clubbed, entire. *Berries* one, two or three, slightly united; when single, globular, fleshy, orange-coloured, smooth, the size of a pea, one-seeded. *Seed* globular. *Embryo* simple, lodged near the base of the perisperm on the outside.

Observations.

In a good soil, when the plants are regularly and moderately watered, the leaves grow to be from three to four feet long, and contain a number of fine, remarkably strong, white fibres, which run their whole length. The natives make their best bow strings of these fibres. To separate them from the pulpy parts, they lay a single fleshy leaf, on a smooth bit of board, on one end of which (leaf,) they place one of their great toes, and with a thin bit of hard stick held between the two hands, they scrape the leaf from them, and very quickly remove every part of the pulp. It can also be removed by steeping the leaves in water, till the pulpy parts rot, &c. as is practised with flax, and hemp in Europe, but with me this discoloured the fibres much.

II. About eighty pounds of the fresh leaves, yielded one pound of the clean dry fibres. These
163 were gathered at once from a small bed of the plants which I planted about twelve months before in my own garden. The bed was scarcely three yards square, and the leaves upon an average less than two feet long, owing to my having gathered them before they were at their full size. Full grown leaves of three or three and a half feet long yielded in the proportion of one pound of the clean fibres (flax,) for every forty pounds of fresh leaves, for eight pounds of such leaves, yielded me three ounces of clean fibre; hence I conclude that this plant might be cultivated to advantage. For even according to the first mentioned rate, of one pound of the fibres, from a bed of three square yards of the plants, one acre would yield one thousand six hundred and thirteen pounds of the clean flax at a gathering, two of which may be reckoned on yearly, in a good soil, and a favourable season after the plants are of a proper age, mine being only as yet about twelve months old, which I imagine is too short a time for them to have acquired sufficient size, and strength, to yield the best and largest proportion of fibre.

There are certainly a great variety of uses to which these fibres may be applied better than any other substance yet known. I am inclined to think that the fine line, called China grass, which is employed for *fishing lines, fiddle strings, &c.* is made of these fibres.

It grows readily from the slips, which issue in great abundance from the roots, requires little or no care, and as they are perennial, would not require renewing often, if at all; indeed the bed in my garden requires thinning.

Some years ago, I remember to have seen a bed or two of these plants in Dr. Russell's garden at Vizagapatam, which grew most luxuriantly, more so than mine has done; which gives reason to think that a rich sandy soil may suit this plant better than our stiffer soil
II. about Samulcota. Should it ever become an object of culture, a less expensive and more ex-
164 peditious method of clearing the fibres from the pulpy parts of the leaves, than that of the natives above-mentioned, must be contrived; for as they now do it, that alone would involve a greater expence than every other charge.

DIANELLA. Lamarck.

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Calyx none. *Corol* six-petalled, the three inner refracted. *Filaments* with glandular apices. *Anthers* perforated at top. *Germ* superior, three-celled; *cells* few-seeded; *attachment* subsuperior. *Berry* three-celled. *Seeds* few (from one to two, in each cell.) *Embryo* in the apex of an ample perisperm.

D. *nemorosa. Lamarck. Encyclop.* 2. 273.

Perennial. *Leaves* cauline, bifarious, ensiform.

Dracæna *ensifolia. Willd.* 2. 158.

Gladiolus odoratus Indicus. *Rumph. Amb.* 5. *t.* 37.

In 1800 the roots were sent from Sumatra, where I am told it is indigenous, to the Botanic Garden at Calcutta, by Dr. Campbell, where the plants thrive well, and continue in blossom and seed most part of the year.

Root fibrous. *Stems* perennial, several from the same root, erect, or nearly so, smooth, jointed at the insertion of the leaves, somewhat compressed. In our plants the naked part of the largest is only as thick as a ratan, and two or three inches high, and the height of the whole, about three feet. *Leaves* cauline, bifarious, alternate, sheathing, spreading, or a little recurved, sword-shaped, keeled on the back, smooth on both sides; edges most minutely serrulate. *Sheathes* compressed, embracing the stem edge-ways, as in the *Irideæ*. *Scapes* from the centre of the leaves, round, smooth, with two or three very short leaves at nearly equal distances. *Panicles* terminal, with ramifications ending in small umbellets of pedicelled, pale, whitish green, small, inodorous, naked flowers. *Involucres* cordate, spathiform. *Calyx* none. *Petals* six, ovate-oblong, exterior three broader, expanding; inner three refracted, or rigidly bent back. *Filaments* six, inserted between the petals and germ, broad, and rather short, with their apices incurved, each augmented at the apex with a large yellow gland. *Anthers* issuing from the forementioned glands, erect, tapering, with two small round perforations on the top, for the pollen to escape. *Germ* superior, nearly round. *Style* straight, about as long as the stamens. *Stigma* small, somewhat three-dentate. *Berry* three-celled, succulent, size of a large marrow fat pea, smooth, and when ripe, very dark purple. *Seeds* from one to three in each cell, smooth, black, ovate pointed. II. 165

I was long inclined to think this a species of Dracæna, but the corol, and stamens differ so widely from any other Indian species of that genus I have yet met with, that I thought it would be better to adopt Lamarck's name.

TETA. (R.)

Calyx none. *Corol* six-petalled, spreading. *Nectary* turbinate; *petal*-bearing. *Anthers* sessile, in the mouth of the nectary. *Berries* from one to three, one-seeded.

T. *viridiflora. R.* (*.)

Found by Dr. Buchanan at Chittagong, and on the eastern border of the Delta of the Ganges, and introduced by that gentleman into the Botanic Garden at Calcutta, where it blossoms in the months of March and April; the seeds ripen in July and August.

Root perennial; from the crown or united bases of the leaves issue many, long fleshy bi-bres. *Stem* none. *Leaves* radical, petioled, erect, lanceolate, plaited, entire, smooth on both sides, about one foot long. *Scapes* solitary, rising from the centre of the leaves, and about the same length; lower half destitute of flowers and with here and there a long, curved, pointed scale. *Flowers* numerous, collected in fascicles over the upper half of the raceme, short-pedicelled, small, deep green, inodorous. *Bractes* one, two, or three, to each fascicle of flowers; ovate, pointed, concave. *Petals* six, nearly equal, cordate, expanding in a double series, inserted on the outside of the nectary. *Nectary* one-petalled, turbinate, quickly contracting into a small, hexangonal mouth through which the stigma, and part of the anthers are seen. *Filaments* scarcely any. *Anthers* six, sessile, distinctly two-lobed, inserted round the inside of the mouth of the nectary. *Germ* superior, ovate, somewhat three-lobed, three celled, with two *ovula* in each, attached to the lower part of the axis. *Style* short. *Stigma* large, three-sided, rather within the mouth of the nectary. *Berries* from one to three come to maturity, obovate, smooth, succulent, dark-bluish-olive colour, the size of a pea. *Seeds* solitary. II. 166

The plant is elegant in its foliage, even when destitute of flowers, but much more so when in blossom. The very uncommon deep green colour of the flowers, makes it particularly interesting.

POLYANTHES. Schreb. gen. n. 576.

Calyx none. *Corol* funnel-shaped, recurved, equal. *Filaments* inserted into the mouth of the tube. *Germ* in the bottom of the corol.

P. *tuberosa. Willd.* 2. 164.

Leaves linear, shorter than the scape.

Amica nocturna. *Rumph. Amb.* 5. *p.* 285. *t.* 98. II. 167

Hind. Gool shubbo.

Beng. Rujunee-gundha.

In Gardens only, where both the single and double varieties blossom all the year, but chiefly during the rains.

* Probably it may belong to Jussieu's natural order Asparagi.

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ALOE. Schreb. gen. n. 581.

Calyx none. *Corol* erect, with the mouth expanded; bottom nectar-bearing. *Filaments* inserted on the receptacle.

A. *perfoliata. Willd.* 2. 185.

Leaves ensiform, dentate, erect. *Flowers* racemed, reflected, cylindric.

Kadenaku, vel catevala. *Rheed. Mal.* 11. *t.* 3.

Taruni. *Asiatick Researches.* 4. 272.

Sans. Ghrita-koomaree.

Beng. Ghrita-koomaree.

Hind. Gheekoomar. The gum Elwa.

It is common in gardens throughout India.

AGAVE. Schreb. gen. n. 582.

Calyx none. *Corol* erect, superior. *Filaments* longer than the corol, erect.

A. *Cantula. R.*

Stemless. *Leaves* spino-dentate. *Scape* ramous. *Tube* of the corol contracted at the middle. *Stamina* much longer than the corol. *Style* about the same length.

Aloe *Americana. Rumph. Amb.* 5. *t.* 94.

II. 168 *Sans.* Kantula, which induces me to think it indigenous. Bilatee-ananas, (i. e. Europe Pine apple) is the Hindoo name, which seems to imply that this plant is not a native of India. Be that as it may, it is now common every where. In Bengal the plants blossom in May and June, when from ten to fifteen years old, and are then from twenty to thirty feet high.

HEMEROCALLIS. Schreb. gen. n. 58.

Calyx none. *Corol* campanulate; *tube* cylindric. *Stamina* declinate.

1. H. *fulva. Willd.* 2. 197.

Leaves bifarious, linear, acute, keeled, smooth. *Scape* twice the length of the leaves. *Stamina* ascending, the length of the revolute divisions of the corol.

It is only, as far as I know, found in our gardens; it may not therefore be a native of India, though known to the native gardeners by the Hindoo name *Gool nurgus (Narcissus).* It was introduced by Dr. W. Carey into the Botanic Garden at Calcutta from Dinagpoor, where if not indigenous, it may have been carried thither from China, its native country through Bootan.

2. H. *cordata. Thunb.*

Leaves round-ovate-cordate, many-nerved, acuminate; *petioles* deeply channelled, with winged margins.

From China this elegant plant has been introduced by Mr. W. Kerr, into the Botanic Garden at Calcutta, where it thrives luxuriantly, and blossoms during the latter part of the rains. The leaves are about eight inches long by six broad; the petioles rather longer than the leaves. The racemes about two feet high, bearing about twenty, alternate, large, six inches long, pure white, fragrant flowers, which expand about sun set, and droop in the morning.

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ACORUS. Schreb. gen. n. 586.

Spadix cylindric, covered with florets. *Corol* six-petalled, naked. *Style* none. *Capsule* three-celled.

A. *calamus. Willd.* 2. 199.

The point of the scape very long and leafy.

Vaembu, *Rheed. Mal.* 11. *t.* 48.

Sans. Vucha.

Beng. Buch, or shwet-buch. Gora-buch.

Sweet flag, or Calamus aromaticus. Mat. Med.

It is common in gardens throughout India.

TACCA. Schreb. gen. n. 588.

Calyx six-parted, staminiferous. *Corol* none. *Stamina* vaulted. *Germ* inferior, one-celled; *orula* numerous, attached to three equidistant parietal receptacles. *Berry* one-celled. *Seeds* many. *Embryo* subcentrifugal; and furnished with a perisperm.

1. T. *aspera. R.*

Leaves oblong, entire; *petioles* and *scapes* scabrous.

Found by Mr. J. R. indigenous in the vallies amongst the hill behind Chittagong: from thence it was introduced into the Botanic Garden at Calcutta where it blossoms during the hot and rainy season, and the seeds ripen three or four months after.

Root an oblong, curved tuber, of a middling size, with wiry fibres from its sides; inward colour pale yellow; perennial. *Stem* none, or very trifling. *Leaves* radical, petioled recurvate, oblong, entire, acuminate, smooth, strongly marked with parallel veins, and somewhat bullate; from eight to sixteen inches long, and from four to eight broad. *Petioles* shorter than the leaves, sheathing at the base, and above that having a groove down the inside, the whole considerably rough, with small visible sharp points. *Scapes* axillary, solitary, about as long as the

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petioles, and rough like them, cylindric, direction from erect to diverging, and often variously bent. *Involucre* four-leaved, besides many filiform filaments, which are mixed amongst the pedicels. Exterior two leaves of the involucre stem-clasping, reflexed, broad ovate-lanceolate, finely acuminate, many-nerved, two or three inches long, and one and a half broad. The interior pair much longer, broad-petioled, ascending in the form of a vault over the flowers, oval-ventricose, many-nerved, smooth and coloured; length, petioles included, about five inches, and three broad. *Flowers* from four to eight, long-pedicelled, large, at first nearly erect, but on the second day of expansion drooping, colour, a mixture of greenish purple and yellow; about the same number of very long, filiform, smooth pendulous bodies are found interspersed among the pedicels. *Calyx* superior, one-leaved; *base* bowl-shaped; *border* consisting of six large coloured segments; *exterior* three, rather narrow, more pointed, and less deeply coloured; *inner* three, oblong, obtuse, or emarginate, soon after expansion becoming completely reflex. *Corol* no other than the segments of the border of the calyx, which very much resembles one. *Filaments* (*petals* of *Forster*) six, inserted about the middle of the tube of the calyx, resembling little conic vaults. *Anthers* on the inside of the exterior *wall* of the vaults. *Germ* inferior, clavate, six-ribbed, one-celled, containing numerous *ovula*, attached to three bifid, parietal receptacles. *Style* short. *Stigma* three-lobed; *lobes* large, coloured, emarginate on the exterior edge. *Berry* oblong, fleshy, an inch and a half long, and one broad, six sharp-ribbed, crowned with three semilunar marks, the remains of part of the calyx, one-celled. *Seeds* numerous, attached to three divided parietal receptacles, reniform, ribbed. *Integument* single, tough, dark brown.

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2. T. *lævis*. *R.*

Leaves oblong, entire; *petioles* and *scapes* smooth.

Moti munda, the vernacular name in Silhet, where it is indigenous, and from whence it was introduced into the Botanic Garden at Calcutta, where it blossoms during the hot, and rainy season.

Root a subcylindric, perennial tuberous body furnishing numerous dark brown fibres, which penetrate the soil in every direction. *Stem* none. *Leaves* radical, petioled, oblong, acuminate, entire, smooth on both sides; general length about twelve inches, and the breadth five or six. *Petioles* about as long as the leaves, base sheathing, above the sheathing part cylindric, and slightly grooved on the inside, every part perfectly smooth. *Scapes* axillary, solitary, shorter than the petioles, round, smooth, of a dark green purple colour; direction more or less recurved. Involucre four-leaved; *leaflets* equal, and equally disposed crosswise in opposite pairs, sessile, ovate, finely acuminate, smooth, many-nerved, about two inches long, and one broad. *Flowers* from six to twelve in the umbel, intermixed with many long, filiform filaments, pretty long pedicelled, large, of a dark greenish grey violet colour. *Calyx* one-leaved; *tube* or *base* bowl-shaped, and permanent; *border* six-parted; three exterior *segments* rather longer, narrower, and more pointed than the inner three, which are broader, all deciduous. *Filaments* six, inserted into the tube of the calyx near its base, vaulted, with the linear, two-lobed *Anthers* attached to the inner side of the vault. *Germ* inferior, clavate, turbinate, three-sided, six-keeled, one-celled, and containing numerous *ovula*, attached to three bifid parietal receptacles. *Style* short. *Stigma* of three rather recurved double lobes, alternate with the stamina.

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3. T. *pinnatifida*. *Willd.* 2. 200. *Forst. gen. N.* 35.

Leaves pinnatifid. *Involucre* many-leaved.

Tacca littorea. *Rumph. Amb. vol.* 5. *t.* 114, table 112 of the same, though quoted for a variety of this by Forster, is an *Arum* figured and described by me under the name *A. campanulatum*.

Lekin of the inhabitants of the town of Malacca.

Tacca *pinnatifolia*. *Gært. sem.* 1. *p.* 43. *t.* 14. *f.* 2.

A native of the Moluccas, and Malay countries, and from the latter introduced by Dr. Harris, of Madras into the Company's Botanic Garden at Calcutta in 1800, where it blossoms in June and July. *Seeds* ripen in October.

Root tuberous, perennial, often as large as a child's head, round, and pretty smooth; with but few slender fibres from its surface, intensely bitter when raw, but yielding a great quantity of beautifully white starch, of which the best flour for confectionary, puddings, &c. is made. *Leaves* radical, petioled, three-parted; *divisions* bi-tri-partite and ultimately pinnatifid, with waved margins, smooth on both sides, length and breadth almost equal, and often two or three feet each way. *Petioles* columnar, slightly grooved, from one to three feet long. *Scapes* radical, round, tapering, smooth, naked, nearly twice the length of the petioles, slightly grooved, and striped with darker and paler green. *Umbel* simple, composed of from ten to forty long-pedicelled, drooping, greenish flowers, intermixed with about as many long, slender, smooth, simple, drooping filaments or bractes. *Involucre* from six to twelve leaved; *leaflets* lanceolate, recurvate, beautifully marked with pale purple veins. *Calyx* superior, one-leaved, globose, fleshy, permanent, six-parted; *segments* obtuse, incurved, alternately broader, green, with the margins somewhat purple. *Corol* none, as I consider what Forster so calls to be the stamina. *Filaments* six, short, with broad, coloured margins, inserted on the segments of the calyx; *apices* white, vaulted inwards over the stigma. *Anthers* linear, two-lobed, attached to the middle of the vault, with their apices outwards. *Germ* beneath, turbinate, six-sided, crowned with three large, hairy, convex, purple glands, one-celled. *Seeds* many, attached to three equidistant, parietal receptacles. *Style* short, rising from the centre of the three purple glands, and solidly composed of three united into one. *Stigma* broad, peltate, composed of three, two-lobed divisions. *Pericarp*; *berry* nearly round, size of a pigeon's egg, crowned with the

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Page Carey Ed. withered calyx, and marked with six, protuberant, equidistant, vertical ribs, smooth, when ripe yellow, one-celled. *Receptacles* as in the germ. *Seeds* numerous, attached to the three parietal receptacles, as in the germ, oval, or ovate, longitudinally furrowed, light brown, each enveloped in a small portion of colourless, succulent pulp, which may be termed a complete aril. *Integuments* two, *exterior* spongy; *interior* a thin, reticulate, white membrane. *Perisperm* conform to the seed, rather succulent while fresh. *Embryo* minute, and lodged in the end of the perisperm next to the (umbilicus,) subcentrifugal.

CANARINA. Schreb. gen. n. 603.

Calyx six-leaved. *Corol* companulate. *Stigmas* six. *Capsule* inferior, six-celled, many-seeded.

C. *moluccana. R.*

Erect, smooth. *Leaves* opposite, short-petioled, ovate oblong, serrate, smooth. *Flowers* terminal, and axillary. *Calyx* subpinnatifid.

A native of the Moluccas. The specimens seen are herbaceous. The number six prevails throughout the flowers.

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CORYPHA. Schreb. gen. n. 1694.

Spathes many. *Spadix* (terminal) supra-decompound. *Perianth* three-toothed. *Corol* three-petalled. *Germ* superior, three-celled; *cells* one-seeded; *attachment* inferior. *Berries* from one to three, conjoined, globose, one-seeded. *Embryo* in, or near the apex of the perisperm. Gærtner says he found it in the base of the perisperm in *umbraculifera.*

1. C. *Talliera. R.*

Leaves subrotund, palmate-pinnatifid, plaited; *segments* forty pair, margins of the channel of the petioles armed. *Inflorescence* pyramidal, the length of the trunk of the tree.

Sans. Tali.

Beng. Tara, Tallier. Tareet.

This elegant, stately Palm, is a native of Bengal, though scarce in the vicinity of Calcutta. Flowering time the beginning of the hot season. The seeds ripen about nine, or ten months afterwards.

Trunk perfectly straight, about thirty feet high, and as near as the eye can judge equally thick throughout, of a dark brown colour, and somewhat rough with the marks left by the impression of the fallen leaves. *Leaves* palmate-pinnatifid, plaited, subrotund. *Leaflets* or divisions of the frond united rather more than half way, numerous, generally about eighty, or forty pairs, linear-lanceolate, pointed until broken by the wind, or otherwise, polished on both sides, with a strong somewhat four-sided rib running their whole length; generally about six feet long, greatest breadth about four inches. The thread which forms part of the *Linnæan specific character* of *corypha umbraculifera*, is sometimes present, sometimes wanting, at best
II. such perishable marks deserve no notice. *Petioles* from five to ten feet long, remarkably strong,
175 upper side deeply channelled, the sharp margins armed with numerous, short, strong, dark-coloured polished, compressed spines. *Spathes* just as numerous as the primary and secondary ramifications in the spadix, all smooth, and obtuse. *Spadix* supra-decompound, issuing in the month of February from the apex of the tree, and centre of the leaves, forming an immense, diffuse, ovate panicle, of about twenty or more feet in height, so that the height of the whole tree, from the ground to the top of the spadix is now about fifty feet. Primary branches alternate, round, spreading nearly horizontal, with their apices ascending. Secondary ramifications alternate, bifarious, compressed, drooping, recurved, soon dividing into numerous, variously curved, smaller, subcylindric, branchlets, covered with innumerable, small white, odorous, subsessile flowers. *Calyx; perianth* inferior, minute, obscurely three-toothed. *Petals* three, oblong, concave, fleshy, smooth, expanding, many times larger than the perianth. No nectary. *Filaments* six, nearly of the length of the petals, at the base broad, and in some measure united. *Anthers* ovate. *Germ* above, three-lobed, three-celled with the embryo of a distinct seed in each, attached to the bottom of its cell. *Style* shorter than the stamina. *Stigma* simple. *Berries* from one to three conjoined, though one is the most common, and then the rudiments of the other two are present, they are singly quite round, about the size of a crab-apple, when ripe, wrinkled, and of a dark olive, or greenish yellow colour. The pulp is but in small proportion, and yellow when the fruit is ripe. *Seed* solitary, round, attached to the base of the berry, of a white colour, and horny substance, with a small vacuum in the centre. *Embryo* lodged in the apex, which circumstance alone, is sufficient to distinguish it from *Gærtner's Crypha umbraculifera.*

II. The leaves of this tree are employed by the natives, to write on with their pointed steel
176 bodkins, and also to tie the rafters of their houses, for they are said to be strong and durable. I do not find that the wood is applied to any useful purpose.

2. C. *elata. R.*

Leaves lunate-cordate, palmate-pinnatifid, plaited; *segments* from forty to fifty pair; *stipes* armed. *Inflorescence* globular, one-fourth the length of the trunk of the tree.

Beng. Bujoor, or Bujur-batool.

This stately palm is a native of Bengal, where it flowers in March and April; the seeds require about twelve months to ripen.

Trunk straight, but often varying in thickness. I have two trees, which were pretty well ascertained to be about thirty years old when in flower; one was seventy feet to the base of the inflorescence, the other about sixty; circumference near the root eight feet, and about the

middle of the trees five and a half or six; their whole length strongly marked with rough, dark coloured, spiral ridges, and furrows, which plainly point out the spiral arrangement of the leaves. The ligneous fibres, as in the order, are on the outside, forming a tube for the soft spongy substance within, of a dark chocolate colour, tough and hard, but by no means equal, in either quantity or quality, to the very serviceable wood of *Borassus flabelliformis.* Page Carey Ed.

Leaves (fronds,) round the top of the trunk, immediately under the base of the inflorescence, numerous, palmate-pinnatifid, plaited from eight to ten feet each way; *segments* generally from forty to fifty pair, united about half their length, ensiform, apices rather obtuse and bifid, texture hard, smooth on both sides. When the tree begins to blossom, the leaves wither and soon fall off, leaving the fructiferous part naked. *Petioles (stipes)* from six to twelve feet long, concave above, with the thin, hard, black margins thereof cut into numerous, very short, curved spines. *Spathes* numerous, there being one at each joint of the various ramifications of the spadix, all smooth and when recent, of a pale yellowish green. *Inflorescence,* (spadix) terminal; it may be called an immense, more than supra-decompound, round panicle; in this species it is of a much smaller span than the leaves, and only about one fourth or one fifth part of the whole height of the tree; the various and innumerable ramifications are always alternate, smooth and of a pale yellow colour. *Flowers* small, sessile, collected in little bundles over the ultimate divisions of the panicle, pale yellow, small, rather offensive. *Calyx* small, three-toothed. *Petals* three, oblong, reflexed, shorter than the stamina. *Filaments* six, broad at the base, and there united, toward the apex, slender and incurved. *Anthers* ovate. *Germ* superior, round-ovate, three-lobed, three-celled, with one *ovula* in each, attached to the bottom of its cell. *Style* short, three-grooved. *Stigma* three-lobed. *Berry* globular, the size of a musket ball, olive-coloured, smooth when fresh, but it soon becomes dry and wrinkled, one-celled; the two abortive lobes of the germ are always to be found at the base. *Seed* solitary, sub-globular. *Integuments,* apparently two, but they are firmly united, and of a friable texture; the *exterior* one pale yellowish brown, and veined; the *interior* one brown, and adhering firmly to the perisperm. *Perisperm* conform to the seed, of a hard, horny texture, and pale gray colour. *Embryo* simple, short, cylindric, lodged near the apex of the perisperm. II. 177

3. C. *umbraculifera. Willd.* 2. 201. *Gært. sem.* 1. 18. *t.* 7.

Leaves sublunate, palmate-pinnatifid, plaited. *Segments* from forty to fifty pair; *petioles* armed. *Inflorescence* pyramidal, equalling the trunk of the tree, *(Embryo* in the base of the seed. Gært.) II. 178

Codda-pana. *Rheed. Mal.* 3. *t.* 1-12.

Talipat. *Knox. hist. of Ceylon.*

Cing. Tala, or Talagas.

Tam. Conda-pani.

This is an intermediate species, (with regard to size,) between *Taliera* and *Elata.* From Ceylon it has been introduced about nine years into the Botanic Garden at Calcutta. The seeds were fully as large as those of *Taliera,* consequently much larger than in *Elata.* This alone is a sufficient mark in a tree of this nature to distinguish it from *Elata;* unfortunately I did not examine the situation of the *embryo,* we must therefore take it for granted that Gærtner was correct in placing it in the base of the seeds; our young trees, are only now, when nine years old, beginning to exhibit the first appearance of a trunk.

In the same Garden are plants of *Taliera,* of the same age; their appearance at this period is so very different as to announce their being distinct species.

4. C. *Utan. Lamarck. Encyclop.* 2. 131.

Leaves semicircular, palmate, pinnatifid, plaited; *segments* from twenty-five to thirty pair; *petioles* very long, and much armed.

Lontarus silvestris. *Rumph. Amb.* 1. 56. *t.* 11.

A native of the Moluccas. One young tree of this species is in the Botanic garden at Calcutta; it was brought from Amboyna; though now about twelve years old, it only begins to form the appearance of a trunk, which, at present promises to be longer than in *umbraculifera.* The stipes or petioles are much longer than in any of the other species, and the leaves expand little more than half a circle, as in Rumph's figure, and have only about half the number of segments the others have.

LICUALA. Schreb. gen. n. 1691. II. 179

Calyx three-toothed. *Corol* three cleft. *Germ* superior, three-lobed, three-celled. *Cells* one-seeded: *attachment* inferior. *Style* single. *Stamina* simple. *Drupe* one-celled, one-seeded. *Embryo* a little above the base on the inside.

1. L. *peltata. R.*

Fronds palmate, orbicular, peltate. *Stipes* armed. *Drupe* turbinate; no *nectary.*

This small *palm* is a native of the woody mountainous parts near Chittagong, which separate that province from the Burma dominions; it was brought from thence to the Botanic Garden at Calcutta by Mr. William Roxburgh, where it blossoms in November and ripens its seed in May.

Trunk, in our young trees, short, and entirely embraced by the base of the petioles, and a web of coarse, light brown fibres, down to the ground; in that state it is about as thick as a man's thigh. *Leaves* (fronds,) alternate, long-petioled, orbicular, peltate, smooth, divided to the base into from twenty to twenty-five wedge-shaped, dentate-truncate, plaited portions; the superior two, or more, are much broader and longer, being composed of from ten to fifteen

Page Carey Ed. ribs, while the lateral, and inferior ones are composed of from three to five only; the apices of these ribs taper off conically, and have their points bifid, the breadth or length of the whole leaf, for they are nearly the same size, from three to four feet. *Petioles* or stipes spreading, three or four feet long, nearly triangular, having the two lateral edges armed with numerous, dreadful, strong, variously curved, smooth, dark brown, sharp spines of different sizes; toward
II. the base channelled, stem-clasping, and firmly tied over each other, and round the trunk, by
180 a web of strong, coarse, light brown fibres, which issue from the margins, and begin where the spines end. *Spadices* axillary, solitary, rising several feet above the leaves, their whole length being from ten to fifteen feet, of one uniform thickness, which is that of a man's fore-finger; from the upper part, at the distance of about a foot from each other, issue pendulous, cylindric spikes of about a foot and a half long beyond the spathe; these are wholly covered by numerous, sessile, diverging, pretty large, greenish white, inodorous flowers. *Spathes* seven or eight, tubular, embracing the whole of the spadix; from the mouths of the last four or five, the pendulous spikes issue; all the tender parts are covered with a large portion of ferruginous dust. *Calyx* inferior, one-leaved, campanulate; *mouth* obscurely three-toothed; outside sericeous, permanent. *Corol* one-petalled, outside sericeous, permanent. *Tube* campanulate, the length of the calyx. *Borders* three-cleft; *divisions* expanding and tapering to rather obtuse points. No *nectarium*. *Filaments* six, short, broad at the base, and inserted round the inside of the mouth of the tube of the corol. *Anthers* sagittate. *Germs* three, forming a short, turbinate, truncate body, like a single germ, but perfectly distinct, except the base of the *style*, which is about as long as the stamina, and rises equally from the three, and keeps them together. *Stigma* simple. *Drupe* obovate, the size of a field bean; a little to the inside of the vertex a three-cornered, three-toothed tubercle marks where the style joins this fertile lobe of the germ to the two abortive ones; when ripe orange-red, and smooth, one celled. *Pulp* in considerable quantity, orange-coloured. *Nut* conform to the drupe, much pointed below; above are three slight elevations running from a point under the tubercle of the drupe, hard, dark brown, one-celled. *Seed* single, conform to the nut. *Integuments* a single, very
II. thin, brown membrane. *Perisperm* conform to the seed, horny, from the back a ferruginous
181 spongy body penetrates to, or beyond the centre, and there enlarging, it occupies a considerable space. *Embryo* lodged in a conic pit, a little above the base on the inside.

2. L. *spinosa. Willd.* 2. *p.* 201.

Leaves digitate-palmate. *Spadix* shorter than the armed petioles.

Licuala arbor. *Rumph. Amb.* 1. *t.* 9.

Corypha *licuala, frondibus palmatis foliolis linearibus nervosis apice præmorsis. Petiolis basi spinosis, spadice erecto stricto. Lamarck. Encyclop.* 2. 131.

ACHRAS. Schreb. gen. n. 593.

Calyx six-leaved. *Corol* six-cleft, with scales on the inside. *Germ* superior, from eight to ten celled; *cells* one-seeded; *attachment* interior. *Berry* from eight to ten celled. *Seed* solitary. *Embryo* erect, and furnished with a perisperm.

A. *Sapota. Willd.* 2. 224.

Flowers solitary. *Leaves* lanceolar, lucid.

A native of China, from thence introduced into the Botanic Garden at Calcutta, where growing in the same place with the West India tree they are not to be distinguished from it. The China trees have not yet blossomed, but those from the West Indies flower in the hot season, and the fruit ripens in the rains.

BERBERIS. Schreb. gen. n. 595.

Calyx six or more, leaved. *Corol* six-petalled; at the base are two glands. *Germ* superior, one-celled two or more-seeded; *attachment* sub-inferior. *Berry* from two to three-seed-
II. ed. *Embryo* erect and furnished with a perisperm.
182 1. B. *asiatica. R.*

Shrubby. *Leaves* obovate-oblong, hard, spinous-toothed. *Spines* triple. *Racemes* axillary. *Pedicels*, and *flowers* erect. *Nectarial* glands subcylindric. *Germs* from five to six-seeded.

Berberis ilicifolia. *Asiat. Researches.* 6. *p.* 357.

A native of the mountainous countries north of Hindoosthan, where it was first observed by Captain Hardwicke, on his journey to Shreenagur, and afterwards found by Dr. Buchanan in Napal, from whence the latter sent seed to the Botanic Garden at Calcutta in 1802; in April 1808 the plants therefrom blossomed for the first time. In appearance it resembles the common Berbery bush of Europe.

Stems several from the same root, bending much to one side. *Branches* slender, after the first year spreading and drooping; *young shoots* angular, and furrowed. *Bark* of the old ligneous parts of a light ash colour, and yellow within; and so is the wood; the height of our shrubs now when seven years old, is from four to eight feet. *Spines* three, rarely five-fold from one base, straight, strong, and sharp. *Leaves* in fascicles in the axills of the spines, subsessile, obovate, and oblong; *margins* spinous, with circular sinuses between, texture hard, smooth on both sides, but reticulate with veins; from one to two inches long. *Stipules* small, subulate, petiolary, having some small scales intermixed with the insertions of the leaves. *Racemes* solitary, from the centre of the fascicles of leaves, many-flowered. *Pedicels* often as long as the racemes, straight, one-flowered; sometimes there is no raceme, and then several, long-pedicelled flowers occupy its place. *Flowers* rather large, pure yellow.

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Bractes at the base of the pedicels triple, one-flowered, ovate, acute. *Calyx* about nine-leaved, imbricate. *Leaflets* unequal, yellow, smooth. The *exterior* three minute, and may be called bractes; the next three larger; the *inner* three still larger, and nearly as long as the petals. *Petals* six, in two series, round-obovate; exterior margins a little notched and curled in over the anthers. *Nectarial* glands subcylindric. *Filaments* shorter than the petals, and opposite to them, thick at top. *Anthers* a polleniferous, oblong, operculated pit on each side near the apex. *Germ* oblong, one-celled, on the inside is a ridge; four, five, or six seeds are attached to its base. *Style* scarcely any. *Stigma* large, peltate, with a pit in the centre. *Berries* ovate, rather large than the common *berbery* of Europe, smooth, with red, succulent, acid pulp; colour a dark purple, with a bloom over it, like that of the common plum, one-celled. *Seeds* two or three, attached as in the germ, oblong, somewhat rugose. *Integuments* two; the *exterior* one thick, spongy, and brown; the *inner* one membranaceous. *Perisperm* conform to the seed, yellow. *Chalaza* large and conspicuous on its apex. *Embryo* nearly as long as the perisperm, straw-coloured, erect. *Cotyledons* oblong. *Radicle* subcylindric, inferior.

2. B. *angustifolia. R.*

Shrubby. *Racemes* simple; *pedicels* one-flowered. *Spines* single. *Leaves* lanceolar. *Germ* two-seeded.

Found by Francis Pierard, Esq. on the mountains north of Rohilkhund, and Hurdwar.

Spines oftener single than triple, straight, diverging. *Leaves* fascicled in the axills of the spines, sessile, lanceolar, rather rounded at the apex, with a minute spinous point, some of them have a small spinous toothlet on one or both margins, but are otherwise entire, tapering most toward the base; smooth, veined, texture hard, the length from one to two inches, and generally less than half an inch in breadth. *Racemes* axillary, the length of the leaves, solitary. *Flowers* solitary, long-pedicelled, small. *Bractes* oblong, concave, acute, solitary at the base of each pedicel, and sometimes one or two smaller ones near the top. *In B. asiatica*, they are triple at the base of the pedicels. *Calyx* nine-leaved; *leaflets* in three series; the *exterior* three minute; the *inner* three nearly as long as the petals. *Petals* six-obovate, entire. *Nectarial* glands oblong. *Filaments* inserted into the base of the petals. *Anthers* a long operculated pit in each side of the filaments, just under the apex. *Germ* oblong, one-celled, containing two seeds, attached to the bottom of the cell. *Style* short. *Stigma* peltate, glandular. II. 184

3. B. *pinnata. R.*

Leaves unequally pinnate; *leaflets* grossly spinous, dentate. *Racemes* terminal.

Candingne young more, is the vernacular name in the Munipoor Country, where it is indigenous. It flowers in November.

Thunberg's figure of his *Ilex Japonica* is so very like this plant, as to induce me to think they may be the same.

NANDINA. Schreb. gen. n. 596.

Calyx many-leaved, imbricated. *Corol* six-petalled. *Berry* one-celled, two seeded. *Embryo* inverse, and furnished with a perisperm.

N. domestica. Willd. 2. 230. *Thunb. Jap.* 147. *Gært. sem.* 2. 69. *Bot. Mag.* 1109.

Said to be a native of Japan; it was introduced from Canton in China into the Botanic Garden at Calcutta by Mr. William Kerr.

LORANTHUS. Schreb. gen. n. 600.

Calyx uncertain. *Corol* generally one-petalled and often irregular. *Germ* inferior, one-celled, one-seeded; *attachment* superior. *Berry* one-seeded. *Embryo* inverse, and furnished with a perisperm. II. 185

1. L. *bicolor. Corom. pl.* 2. *N.* 139.

Leaves opposite, oblong, smooth. *Racemes* axillary. *Corols* irregular, five-cleft. *Stamens* five. *Berries* oblong.

Beng. Bura-manda.

Vanda is the Sanscrit name. Sir William Jones thought this the general term for all *Parasitic plants.*

Compare with *Loranthus longiflorus*, and also with *falcatus. Willd.*

Teling. Yellinga-wodinaka (wodinaka means parasitical.)

It is always found growing upon the branches of various kinds of trees, and is very ramous. It flowers during the greatest part of the year, and is highly ornamental.

Trunk scarcely any. *Branches* numerous, ascending, woody, bark grey. *Leaves* nearly opposite, sessile, or very short-petioled, from oval to linear-lanceolate, waved, entire, reclined; veins scarcely any; from three to five inches long, and from one to one and a half broad. *Racemes* axillary, single, simple, sub-erect, many-flowered. *Flowers* in size and appearance much like those of the honey suckle. *Bractes* a small, concave, cordate one, presses on the base of the germs on one side. *Calyx* there is no other *perianth* of the fruit, than the above-mentioned bractes; that of the flower, cup-shaped, entire, permanent. *Corol* one-petalled. *Tube* long, a little curved, swelling from the bottom to within a third of the mouth, it then contracts a little; *border* five-parted, the upper fissure much the deepest; *segments* linear, reflexed towards one side. *Filaments* five, from the base of the segments of the corol, short. *Anthers* linear. *Germ* superior, naked. *Style* the length of the corol. *Stigma* clubbed. *Berry* inferior, crowned with the remaining calyx, oblong, smooth, pulpy, one-celled. *Seed* single.

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This is a handsome looking parasite, bearing a great number of very beautiful flowers; its foliage also looks very well; all that part of the branch of the tree above where it grows, becomes sickly, and soon perishes.

This species differs from *Gærtner's Lonicera zeylanica*, in being without the calyx of the fruit, and having only five parts in the corol, &c. but in the raceme they agree. Nor can I reconcile it to be L. *falcatus* of the supplementum, nor L. *loniceroides* of Linnæus, for here the inflorescence bears no resemblance to an involucred umbel. Neither can it be *L. pentandra*, as there the leaves are alternate, with petioles nearly as long as the racemes, in short I cannot well reconcile it to any of the hitherto described species. It unites the two genera of *Loranthus* and *Lonicera*.

In Bengal I have found it with leaves from five to six inches long, and from four to five broad.

2. L. *scurrula*. *Willd.* 2. 232. *Corom. pl.* 2. *N.* 140.

Leaves opposite, ovate, underneath downy. *Flowers* axillary, fascicled. *Corol* irregular, four-cleft. *Stamens* four. *Berries* turbinate.

The natives have no other name for this than *Wodinika*.

It is a parasiatical shrub, but smaller considerably than the last, and much scarcer; it grows upon the branches of trees in the same manner, and flowers during the hot season.

Leaves opposite, petioled, cordate, scolloped, covered with soft white down underneath; about two inches long, and one and a half broad. *Peduncles* numerous, collected in the axills, one or more flowered. *Flowers* considerably smaller than in the last, a rusty grey colour, and covered with grey, farinaceous dust. *Bractes* one, pressing on the germ, as in the last species. *Calyx* of the fruit no other than the bracte of the flower, as in the former. *Corol* one-
II. petalled. *Tube* swelled towards the base. *Border* four-parted; upper fissure deepest; *divi-*
187 *sions* linear, reflexed. *Stamens* four; the *pistillum* as in the last. *Berry* top-shaped, one-seeded.

3. L. *globosus*. *R.*

Leaves opposite, oblong, smooth. *Spikes* axillary. *Corols* regular, six-cleft. *Berries* round-oval.

Kanneli itti-kanni. *Rheed. Mal.* 10. *t.* 5.

Beng. Chota-manda.

A ramous, shrubby parasite, like the two species already described; it is common on trees all over Bengal and flowers all the year.

Leaves generally opposite, though sometimes alternate, and also three-fold, short-petioled, oblong, smooth, entire, of a thick leathery texture, almost veinless; from two to three inches long. *Racemes*, (or rather spikes,) axillary, or between the leaves, or from the old axills; generally solitary, though sometimes there are two, or even three together, much shorter than the leaves. *Flowers* opposite, from three to six pair in the spike, sessile, small, of a greenish-orange colour. *Bractes* no other than the perianth of the fruit. *Calyx; perianth* of the fruit inferior, two-leaved, the under and *exterior* cordate; the *inner* two-toothed; that of the flower is no other than the circular margin of the pit, which receives the flower. *Corol* one-petalled; *tube* gibbous, six-sided. *Border* six-parted; *divisions* alike, and cut equally deep, reflected. *Filaments* six, erect, inserted into the base of the divisions of the corol. *Germ* ovate. *Style* length of the stamens. *Stigma* large, glandular, naveled. *Berry* inferior, round, oval, the size of a pea, smooth; when ripe the pulp is yellow, clammy, and elastic, which makes it adhere to the branches of trees where it terminates, resting on three permanent calyciform bractes and crowned with a ring where the corol
II. stood, round the permanent base of the style, one-celled. *Seed* solitary, conform to the berry.
188 *Integument* single, white, tough, and clammy, marked with twelve whitish striæ. *Perisperm* conform to the seed, six-grooved, green. *Embryo* central, inverse, straight, pale green, nearly as long as the perisperm. *Cotyledons* two, linear-oblong. *Plumula* minute. *Radicle* subcylindric, the length of the cotyledons, superior. Birds are fond of the berries.

4. L. *ferruginosus*. *R.*

Young shoots, as well as the under side of the oval leaves, long, slender, tetrandrous, regular; flowers, fruit, and pedicels, all clothed with much ferruginous pubescence.

Found by Mr. William Roxburgh, growing on trees in the forests of Pulo Pinang.

5. L. *involucratus*. *R.*

Leaves opposite, ovate-cordate, smooth. *Umbellets* axillary; *involucres* four-leaved, four-flowered; *flowers* regular, pentandrous.

A stout, parasitical shrub, found on trees in the forests of Chittagong, Silhet, &c. where it blossoms the greater part of the year.

Branches while young clothed with smooth, shining, dark brown bark. *Leaves* opposite, short-petioled, ovate, and ovate-cordate, sides often unequal, as in most of the plants of this genus, entire, smooth on both sides; from three to four inches long. *Umbellets* axillary, crowded, subsessile, much shorter than the leaves. *Involucres* four-leaved, four-flowered; *leaflets* ovate-lanceolate, smooth, entire. *Flowers* sessile, pretty large, equalling the involucre. *Calyx* superior, short, five-toothed, villous. *Corol; tube* widening toward the mouth, villous. *Border* regular, five-parted. *Segments* linear, revolute. *Filaments* equalling the segments of the corol, and inserted on them below their middle. *Anthers* oval. *Germ* oval,
II. sericeous. *Style* rather longer than the corol. *Stigma* two-lobed.
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6. L. *ampullaceous*. *R.*

Leaves opposite, oblong, polished. *Racemes* axillary, simple. *Flowers* calycled, regular, hexandrous; *tube* of the corol gibbous. *Berries* long-oval.

Found on trees in the forests of Silhet, but seeming to prefer the mangoe trees to all others. Flowering time the dry season, probably the whole year round. Page Carey Ed.

Stem as in our other Indian parasites, the size and shape very uncertain, but numerous from two to four-cleft; smooth branches and branchlets spread in all directions. *Leaves* opposite, short petioled, oblong, entire, smooth, from three to four inches long, and generally less than two in breadth. *Racemes* axillary, solitary, or in pairs, much shorter than the leaves. *Flowers* opposite, short-pedicelled, pretty large, of a greenish yellow colour. *Bractes* oval, one at the base of each pedicel, and two pressing the base of the germ, like an inferior bilabiate calyx. *Calyx* superior, entire, rotate. *Corol* regular; *tube* gibbous; *border* six-cleft; *divisions* revolute somewhat spatulate. *Filaments* six, from the mouth of the tube of the corol, the length of its segments. *Anthers* ovate. *Germ* inferior, one-celled, containing one *ovula* attached to the top of the cell. *Style* longer than the corol. *Stigma* large. *Berry* inferior, long-oval, smooth, yellow, the size of a currant, one-celled. *Pulp* pale yellow, and very clammy. *Seed* solitary, ovate. *Integuments* two; the *exterior* one marked with six longitudinal fibres; the *inner* one membranaceous. *Perisperm* conform to the seed, six-grooved, green. *Embryo* cylindric, inverse. *Cotyledons* short, semicylindric. *Radicle* cylindric, with a turbinate apex, rising above the perisperm, inverse.

7. L. *clavatus. R.*

Leaves opposite, broad-lanceolate. *Flowers* axillary, few together, tetrandrous. *Corols* irregular, four-cleft; *berries* clavate. II.

A delicate, shrubby parasite, found in the Silhet district, growing on *Averrhoa Carambola.* 190

8. L. *pentapetalus. R.*

Leaves opposite, from lanceolate, to ovate-cordate, and obliquely alternate, smooth. *Racemes* axillary. *Flowers* pentandrous. *Petals* five, with an enlarged three-sided base.

A large, very ramous, shrubby plant, found growing on various trees in the forests of Silhet. *Flowers* red, appearing about the beginning of the rains in June.

Branches and *branchlets* columnar, and quite smooth. *Leaves* opposite, petioled, from lanceolate to ovate-cordate, obliquely alternate, from the middle to the apex, entire, smooth; from three to four inches long, and about two broad. *Racemes* axillary, solitary, or paired, straight, simple, often as long as the leaves, smooth. *Flowers* very numerous, short-pedicelled, smooth, scattered, red. *Bractes*, an obliquely-ovate one embraces the base of the germ on the outside. *Calyx* superior, rather small, sub-entire, smooth. *Petals* five, the base of each swelled out into a fleshy three-sided body, giving to the bottom of the corol, a globular form, and meeting in the centre, leaving only a small aperture for the style; above tongue-shaped, and recurved. *Filaments* five, inserted in the petals. *Anthers* ovate. *Germ* oblong, one-celled, containing one *ovula*, pendulous from the top of the cell. *Style* four-sided, jointed, or appearing so, near the middle. *Stigma* a little enlarged. *Berries* oblong, smooth, of a greenish yellow, one-seeded, &c. as in the genus.

BAMBUSA. Schreb. gen. n. 607.

Calyx calycled, from two to three-valved, many-flowered. *Corol*, glume two-valved. *Style* bifid. *Seed* one. II.

1. B. *arundinacea. Corom. pl.* 1. *N.* 79. 191

Spikes half verticelled; *calyces* about four-flowered, half of which are male; *nectaries* three-leaved.

Arundo *bambos Linn. sp. pl.* 120.

Ily, Rheed. Mal. 1. *t.* 16.

Beng. Bans.

Teling. Mulkas, Vedroo.

Tam. Mungil, vel Munkil.

It delights in a rich, moist soil, such as the banks of rivulets, lakes, &c. among the mountains.

Stems, I fear to call them culms, numerous, from ten to a hundred from the same root, for eighteen or twenty feet straight, then bending gently to one side, piped, jointed, undivided, but with innumerable, very ramous, alternate, winding, bifarious, spreading branches. *Thorns* double, or triple, alternate, on the joints of the *branches* and *branchlets*; when double, a branchlet occupies the centre; when triple the largest thorn stands there; they are remarkably strong, sharp, and somewhat recurved; sometimes they are wanting, particularly in rich moist soils. *Leaves* sheathing, bifarious short-petioled, linear-lanceolate, the upper side and margins backwardly hispid, broad at the base, fine-pointed, from two to six inches long, and half or three quarters of an inch broad; on the rich moist soil on the banks of the Ganges they are from two to four inches broad, and about a foot long. *Sheaths* somewhat downy with a few short, bent filaments on each side of the mouth.

Inflorescence. When in flower the tree is generally destitute of leaves, and as the extremity of every ramification is covered with flowers, the whole tree seems one entire, immense panicle, composed of innumerable, somewhat verticelled spikes, each verticil is composed of several, distichous, oblong, pointed, sessile, rigid spikelets, such as those of ELEUSINE, *Poa*, *&c.* II.

Common *calyx*, calycled, from two to six-flowered, from two to three-valved, *valvelets* equal, oblong, concave, smooth, and of a firm texture; *scales* round the base small, oval, number uncertain; they are also often common to several minute, sterile spikelets. 192

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Hermaphrodite *flowers* one, two, or three below the male. *Calyx* no other than that above described. *Corol* two-valved, the exterior valvelet rather the shortest, oblong, pointed, smooth, cartilaginous; the *inner* valvelet oblong, margins inflected, concave behind, and fringed with hairs round the elevated margins of the posterior concavity. *Nectary* three obovate scales embracing the insertions of the stamens, and germ. *Filaments* six, inserted in the base of the germ. *Anthers* linear, incumbent. *Germ* oval. *Style* single. *Stigma* two-cleft; *divisions* plumose. *Seed* firmly closed in the corol, exceedingly like oats and about the same size.

Male Flowers from one to three above the hermaphrodite. *Pistil* none.

It would be needless, and unnecessary to mention the various purposes to which this most useful plant is put; they are already known to most people.

The Tamul Doctors say the root is diluent; that the bark cures eruptions; the Camphire, or salt *(Tabaseer)* cures all sorts of paralytic complaints, flatulencies, and poisons. The leaves are esteemed the best Emmenagogue; the Chinese are said to possess the same idea. The seed is used for food as rice.

Tabasheer Vedroo Paloo, that is milk of bamboo, of the *Telingas;* and Mungle *Upoo*, salt of bamboo, of the Tamuls, the substance so well described by Dr. Patrick Russell, in *the 80th vol.* of the *Philosophical Transactions* of London, is found in the cavities of the joints of this sort.

II. 193

2. B. *stricta. Corom. pl.* 1. *N.* 80.

Spikes with dense globular verticels. *Calyces* from two to three-flowered, all hermaphrodite; no nectary; exterior glumes of the corols daggered.

Teling. Sadanapa vedroo.

This is clearly a distinct species; it grows in a drier situation, is not near so large, has a much smaller cavity, and is very straight; its great strength, solidity, and straightness renders it much fitter for a variety of uses, than the common sort; the natives make staffs to their spears, &c. of it.

Stems fewer, straighter, and smaller, than in the common sort, otherwise they are the same. *Thorns* oftener wanting. *Inflorescence* the same as in the former. *Verticels* sessile, globular, very dense, entirely surrounding the branchlets. *Spikelets* of the verticel, crowded, distichous, &c. as in the last. *Calyx* as in the last, except that the scales are longer, and common to two or three spikelets. Here the flowers are generally all hermaphrodite, and seldom more than three to the calyx. *Corol* two-valved; *exterior* valvelet downy, with a very stiff, sharp, daggered point. Inner valve as in *B. arundinacea. Nectary* I could not see any. *Stamens* six. *Pistil* woolly. *Stigma* two-cleft, filiform. *Seed* as in the last.

3. B. *Tulda. R.*

Arboreous, unarmed. *Spikelets* about five-flowered, all hermaphrodite. *Nectaries* cuneate, fringed. *Style* three-cleft.

Vansa is the Sanscrit name which Sir William Jones applies to bamboos in general.

Beng. Tulda Bans.

Hind. Peka-Bans.

This is the common bamboo of Bengal, where it grows in the greatest abundance every where. Flowering time the month of May.

II. 194

The *root* consists of many small fibres, spreading in every direction, but to no great distance, nor do they penetrate very deep.

The roots of all the other species are similar.

Stems in old plants numerous from the same root, jointed, smooth, and ramous. In the month of June, soon after the first rains set in, new ones rise up amongst those of the former year and in the same manner in all the other species, at first in the form of a large straight *elephant's tusk*, invested in strong coriaceous sheaths, one at each joint; these shoots rise simple to their full size, from twenty to seventy feet in height, and from six to twelve inches in circumference, in the course of about thirty days; during which period the sheaths drop off, and are soon succeeded by numerous, alternate, ramous, bifarious, unarmed branches, from the joints; before these appear, the shoots look like as many naked fishing rods, of immense size. *Leaves* alternate, bifarious, subsessile, sheathing, linear-lanceolate, acute-pointed, with their bases broad, and often rounded, or cordate; from six to twelve inches long, and about one broad. *Sheaths* of the leaves longer than the joints, and ending in two, lateral, stipulary, bearded processes.

Inflorescence. Before these trees blossom, they must be of considerable age, several years; and even then it is seldom they can be found in this state; at that period the whole plant is destitute of leaves, and forms one immensely, oblong, waving panicle, composed of innumerable, supra-decompound ramifications.

Spikelets lanceolate, sessile, one, two, three, or more at the joints of the most extreme ramifications; each bearing from four to eight, (generally all,) hermaphrodite flowers. *Calyx* calycled, as in the other species described by me. *Corol* two-valved. *Exterior valve* oblong,

II. pointed, smooth, completely involving the inner valve, as well as a portion of the flat rachis in
195 which it is inserted. *Inner valve* concave on the inside, where it presses on the rachis; this concave portion is surrounded with a sharp ciliate margin. *Nectary* of three, broad, cuneate, ciliate leaflets. *Filaments* six, half the length of the valves of the corol. *Anthers* linear, drooping, red-purple. *Germ* obovate, obtusely three-sided. *Style* very short. *Stigma* three, long, feathering. *Seed*, they may best be described by comparing them to oats, which they exactly resemble, and are of the same size.

This species is very generally used all over Bengal, for covering the houses of the na-

tives, scaffolding, &c. &c. If soaked in water for some weeks previously to their being used, they last much longer, and are stronger; if not they are soon devoured by a small species of Bostrichus. It is notwithstanding deemed inferior to *Balkooa* (*Balkoo bans*) of the Bengalees. Page Carey Ed.

This species, *Tulda bans*, so far as I am able to judge at present, is not to be found on the Coast of Coromandel. Its quick growth, size and universal commonness in Bengal, renders it one of the most variously useful plants in India. The young thick shoots, mentioned when describing the stem, are when about two feet high, tender and very frequently pickled, and a most excellent one they make, when properly prepared.

Jowa Buns of the Bengalees, is only a large variety of this species, and used chiefly, for scoffolding, and building the larger and better sorts of houses of the natives. It differs from Tulda in the greater length, and greater thickness of the joints. *Basini bans* of the Bengalees, is another variety of Tulda. It has a larger cavity, and is used chiefly to make baskets.

Behoor bans of the Bengalees, is of a small size, very solid, and strong, much bent to one side, and armed with numerous strong thorns, which renders it very fit for hedges. A staff of this species must be placed in the hand of every young brahmin, when invested with the sacerdotal cord, otherwise they say the ceremony cannot be performed. II. 196

4. B. *Balcooa. R.*

Arboreous, unarmed. *Leaves* sublanceolate; with a cordate base, inflorescence sub-radical, *spikelets* from four to five-flowered, all hermaphrodite.

Beng. Balkoo-bans.

It is a native of Bengal, and on account of its size, and strength, is reckoned by the workers in bamboo work the very best sort for building the houses of the natives, scaffolding, &c. works requiring both size and strength. Flowering time the rainy season, however it rarely arrives at this state, for I have but once met with it in blossom.

Stems similar to the other species, but stouter, and often taller. *Ramifications* also the same. *Leaves* bifarious, subsessile on their sheathing bases, lanceolate, with the base cordate; *margins* slightly hispid; smooth, deep green on both sides; from one to two inches broad, and from four to twelve long. *Sheaths* longer than the joints; exposed parts villous, with a bearded stipulary mouth, (ligula,) rising above the insertion of the leaves. *Inflorescence* in radical, verticelled spikes; *verticels* large, sub-globular, composed of numerous, sessile spikelets, of from four to six hermaphrodite flowers. *Calyx* calycled. *Corol* two-valved. *Exterior* smooth, ovate. *Inner* with the exterior margins ciliate. *Nectary* of three, oval, ciliate leaflets. *Stamina* six. *Style* woolly. *Stigmas* three, and also woolly.

To make this species more serviceable, long immersion in water is required to render them firmer, and proof against the attacks of the Bostrichi, and their larvæ.

There are two varieties of this most useful species. The large the natives call *Dhooli-balkoo*, and the smaller *Balkoo-bans*, which has a smaller cavity, and though not so large a bamboo, is on that account very strong. II. 197

5. B. *baccifera. R.*

Arboreous, unarmed. *Pericarp* a very large, pendulous pyramidal, one-seeded berry.

Beesha. *Rheed. Mal. vol.* 5. *t.* 60. *p.* 119.

Pagu-tullu, of the people of the Chittagong mountains, where the plant is indigenous.

This uncommonly curious berry-bearing bamboo, is a native of the Chittagong mountains.

Growing plants, seeds, and well preserved specimens, were sent me from thence by Mr. Richard Pierard, a gentleman to whom the Botanic Garden at Calcutta is under many obligations. The bamboo he writes is the one in common use in that country, for every purpose of building, &c. His description of the tree is so full and perfect that I do not think I can do better than transcribe what he says, in reply to my queries regarding this plant, viz.

"It bears no thorns; grows in dry places, chiefly on the sides of hills, where the upper stratum of the soil is sandy. The circumference near the base twelve or thirteen inches; height from fifty to seventy feet, beautifully erect, and without the least flexure, or unequality of surface, bare of branches except near the extremity. Perishes after yielding its fruit.

"It yields more or less *Tabasheer* of a siliceous crystallization; sometimes it is said the cavity between the joints is nearly filled with this, which the people call *choona, lime.*" So far Mr. Pierard.

Leaves alternate, bifarious, subsessile on their sheathing base, ovate-lanceolate, smooth on both sides, and slightly ribbed underneath; from six to twelve inches long, and from two to four broad. *Sheaths* of the leaves villous, with their mouths bearded with many long filiform fibres. *Spikes* compound, issuing many together from the joints of the large branches, or upper part of the stem, long, slender, jointed, ramous, each joint furnished with a sheath of nearly its length. *Spikelets* three, four, or more flowered. The inferior scales *(Calyx,)* thereof abortive, or with male flowers. *Corol* of two unequal, long, taper, acute-pointed, smooth valves. *Stamina* six, about as long as the pistil. *Germ* ovate. *Style* single. *Stigmas* three, filiform, woolly. *Pericarp.* In this singular species, it is a very large, hard, fleshy, conical, smooth taper, curved, pointed fruit, with a single, large, oval seed in each. II. 198

6. B. *spinosa. R.*

Subarboreous, dreadfully armed with simple, and compound spines. *Spikelets* from three to five-flowered; *florets* trigynous. *Nectary* three-leaved.

Beng. Behor Bans.

Arundarbor spinosa. *Rumph. Amb.* 4. 14. *t.* 2.

Page Carey Ed.

This beautiful, middling sized, very elegant species, I have only found in the vicinity of Calcutta, where now and then some of the oldest are found to blossom about the beginning of the rains, in June.

Stems scarcely fistulous, jointed, &c. as in the other species; in this many grow so close together, as to appear a single trunk at some distance, and by the help of their bifariously alternate, triple branches, and spines, so completely bound together, that it is a most arduous task to cut down an old clump of them; *joints* from six to twelve inches asunder. The plants, or shoots of the clump, which come into flower, I have observed to be those of the centre, and they are taller, straighter, and with a much longer cavity, and longer joints than the rest, which are shorter, droop more, and wave elegantly with the motion of the wind, notwithstanding they are nearly solid, for it is only the larger stems that have a small cavity, the branches being generally solid; whole height from thirty to fifty feet. *Spines* at the joints, and
II. very generally present, through the whole plant triple; this is evidently the habit, though fre-
199 quently incomplete; the middle one is the largest, and often compound; all are more or less recurved, very strong, and sharp. By the number and strength of these spines, and of the branches of this species, it may be said to form the most impenetrable jungle in India. *Leaves* sessile on their sheaths, bifarious, linear-lanceolate, cuspidate, rarely more than six inches long. The *sheaths* have their mouths ciliate with hairs and filaments.

Inflorescence. The plants of the clump when in flower, form one immense, naked panicle; for at this time there is not a leaf to be found on them. *Spikelets* crowded on the joints of the extreme branchlets, sessile, lanceolate, generally three, four, five or six-flowered, &c. exactly as in Poa. *Florets* the inferior two and terminal one male *hermaphrodite*, or neuter, the middle two, or three, or four *hermaphrodite*. *Calyx*, the number of scales which embrace the base of each spikelet uncertain. *Corol; glume*, two-valved; *exterior* smooth, hard, and pointed; *inner* as long as the exterior, concave behind; *margins* incurved, forming one acute angle, as in *Poa;* edges of the posterior concavity much ciliate. *Nectary* of three, corol-like, oval, ciliate scales. *Filaments* six, three immediately within the nectarial scale, and three alternate with them. *Germ* clavate. *Styles* three, entirely clothed with pale purple wool.

Like the other species, this is employed for various useful purposes; and as it grows to a pretty large size, and with a smaller cavity than any of the others, it is strong and well adapted for a variety of uses.

7. B. *nana. R.*

Shrubby, unarmed.

Sans. Keu-fa, of the Chinese; a native of their country, and now plentiful in the Botanic Garden at Calcutta, but has not yet blossomed in Bengal. It makes most beautiful
II. close hedges.
200 The popular belief, that *Bamboos* often take fire by the violence of their friction, during those hot, dry months, when, what is called, the land wind prevails, is supported by the Sanscrit stanza, quoted by Sir William Jones, *(See As. Res. vol. 4. p. 254,)* of which the following is a copy.

"Delight of the world, beloved Chandana, stay no longer in this forest which is overspread with rigid pernicious Vansas, whose hearts are unsound; who being themselves confounded in the scorching stream of flames, kindled by their mutual attrition, will consume not their own families merely, but this whole world."

HEXANDRIA DIGYNIA.

ORYZA. Schreb. gen. n. 609.

Calyx, glume two-valved, one-flowered. *Corol* two-valved, growing to the seed. *Nectary* two-leaved.

Of this genus I have found only two species, but of the first, sativa, there are between forty and fifty varieties known to, and cultivated by the Indian farmers; they seem all to have sprung from the wild sort called Newaree by the Telingas, and from it the following description is taken.

O. *sativa.** *Willd.* 2. 247. *&c. &c.*

Panicle diffuse.

Unoo, Dhanya, *Vrihi*, the Sanscrit names of the cultivated sort, and *Nivara* the wild
II. variety, called by the Telingas Newaree, Aruz of the Arabians.
201 Dhan the Bengalee name of the plant, and the unhusked rice, and Chaul the clean rice.

Uri the generic Telinga name of the cultivated sorts. Urloo the grain in the husk; and Bium the grain, or rice. Newaree of the Telingas is the plant in its wild state.

This original stock is always found wild in and about the borders of lakes throughout the Circars, is never cultivated so far as I can learn, because the produce, they say, is small, compared to that of the varieties in cultivation.

Root fibrous, annual. *Culms* numerous, near the base floating, or creeping, with the extremities erect, they are jointed, round and smooth, from two to eight or ten feet long, according to the depth of the water. *Leaves* sheathing, long, and slender, backwardly sca-

* An improper name, certainly for the original wild plant which is never cultivated; however as custom has established it for the numerous varieties thereof, I cannot well attempt to alter it in describing what I take for the original, wild stock, from whence all the cultivated varieties have sprung, which I am now describing.

brous; *mouth* of the sheaths crowned with a large, conical, membranaceous, lacerated process. This process, ligula, or stipule, is common to all the varieties I have examined. *Panicle* terminal, thin, bowing when the seed is weighty. *Rachis* common, and partial, angular, and hispid. *Flowers* single, pedicelled. *Calyx* and *corol* as described in the *Genera plantarum*, except that here the large valve of the calyx ends in a very long hispid, coloured awn. *Nectary*, two falcate bodies embracing the posterior half of the germ which are common to all the varieties. *Stamens* six. Page Carey Ed.

The rice of the wild sort above described, is remarkably white, palatable, and reckoned very wholesome; so that it is carefully gathered, and sells dear. The rich esteem it a dainty; and to make it still more delicate, they boil it only in steam. A coarse kind of confection, called *beat rice*, is made of it, and sold in most bazars.

Adepts in agriculture in England and Scotland say there is no such thing in nature as perpetual fertility, they probably do not know that much of the rice land in Asia is so situated as to receive no help whatever from nature, except what the air and rains yield; however the greatest proportion, and the best, are those that are overflowed annually by the inundations of large rivers. These we know receive from the waters much fertilizing matter; but the greatest part of the rice lands in the Circars, are of the former sort; there they depend entirely upon the rains; consequently can receive no help but from the rain that immediately falls upon them, and the dry stubble that is annually left on the ground, together with the remains of a few other plants that may have grown up with the rice. The crop is always allowed to be in every part dry ripe before cut, and is then immediately carried off the field. Cattle are turned to eat up the stubble through the day, but never suffered to remain on it all night, as they are then constantly housed. I speak of those parts the Circars only which are near Samulcota; they cannot therefore communicate much fertility to the ground, and I never saw, nor heard of an east Indian farmer, manuring, in the smallest degree a rice field; yet these fields have, for probably thousands of years, continued to yield annually a large crop of rice, on an average from thirty to sixty-fold; even eighty, or a hundred has been known. II. 202

There is no rotation of crops on rice lands, they lie idle from the time one crop is cut till the next is transplanted into them, during which time the soil is most perfectly dried, I may say burnt up; whether it receives any benefit from being so, is a point on which I cannot pretend to give an opinion.

The best rice lands are extensive open plains, through which large rivers pass, and which are exposed to every wind that blows. No hedge, nor any kind of shelter is here necessary, so that the plants are exposed to the greatest glare of solar light, and the freest circulation of air. The soil is generally of great depth, many feet pure mould without the least mixture of sand, small stones, &c. It is of a darker colour than garden mould in general. During the dry hot seasons these fields retain the water long upon the surface, allowing but little to escape through, so that most of the waste is by immediate evaporation. II. 203

The Hindoo farmers divide the numerous varieties into two orders; the first they call the *Poonas*, or the early sorts; the second the *Pedda*, and Worloo, or *Pedda Panta*, which means the late or great crop.

Division First.

Teling. Poonas. *Sungskrit*, Asoo. *Beng.* Aus.

The varieties of this order are generally, if the weather admits, sown thick in June, or early in July, on such small well laboured spots as are a little above the level of the common rice lands, for fear of their being too long inundated by heavy rains; at the same time it is necessary that those spots should be so situated, as to admit of being watered, in case of too dry weather. In about forty days, if the season has been favorable, the young plants will have attained to the height of from nine to eighteen inches; by this time fields are flooded, slightly ploughed, and made level by dragging by a pair of bullocks, or buffaloes, a long flat piece of wood. The fields being now in the state of very soft mud; the plants are taken up and transplanted by the hand. It is astonishing to see how soon a few labourers, men, women, and children, will plant a field, nothing more is now requisite to bring the crop to maturity, than keeping the fields constantly wet, more or less flooded, according to the sort of rice upon it, for some sorts require very little water, while others require a great deal. When nearly ripe, the water is drained off some days before they cut down the grain, which is done with the sickle, as in most parts of Europe. The produce is then carried to some neighbouring elevated spot, where it is stacked, or immediately trod out by cattle. The grain is then winnowed, dried, and deposited in pits dug in high ground, and lined with the rice straw. The straw is stacked by the careful farmer, and reserved to feed his cattle with, during the hot months when all vegetation is burnt up. II. 204

The following eight sorts are amongst the most common of this division; and those I am best acquainted with, viz.

1st. *Jillama-waree*, is the Telinga name of the plant, and *Jilla-maloo* the ripe grain. This seems the first removed from the wild sort, *newaree*; the awn is shorter, and there are many of the flowers female. The rice is of a dark colour, and when husked, coarse, and reddish.

2nd. *Yerra-dal-waree* the plant, and *Yerro-daloo* the grain.

This sort has also a long awn, there are many male, neuter and female flowers mixed with the hermaphrodite ones. It requires less water than most other varieties, of course the

Page Carey Ed. higher situations suit it best, particularly if the season is very wet. The grain is white, but the husked rice is coarse and reddish; hence the name yerra, which means red.

3rd. *Dal-waree*, and *Dal-waloo* the grain. This sort has also a long awn. It is chiefly cultivated during the dry season, on such spots as can then be watered; both the grain, and husked rice are of a dark blackish brown colour, and it is reckoned a very coarse sort.

4th. *Satica-waree* the plant, and *Saticaloo* the grain. This produces a coarse brown grain, the husked rice of which is coarse, and reddish. It has a long awn, and is not much cultivated.

II. 205 5th. *Tella-koadama*, the plant, the grain is white, but the husked rice is coarse and reddish; it has no awn. This sort is generally sown broad-cast, where it is to grow; it requires little water, and of course is most cultivated on the higher lands that cannot command constant and regular supplies of water.

6th. *Suma-waree* the plant, and *Sumaloo* the grain. This is a small grain, of a dark colour, but the husked rice is white, and tolerably fine. It yields but a small produce, and is not much cultivated. It has no awn.

7th. *Kartee-waree* the plant, and *Kartikaloo* the grain. This sort is much cultivated, to a greater extent than all the other early sorts put together. It has no awn, the grain is of a middling size, brownish coloured; the rice when husked for the table is tolerably fine and white. It does not require a great deal of water.

8th. *Gouree-waree* the plant, and *Gowree-kunkaloo* the grain. This is the finest of the early sorts, the grain has no awn, and is of pale purplish colour, and the husked rice is fine and white.

There are many other sorts belonging to this division, but as I have not had an opportunity of examining them, I say nothing further about them.

Division Second, or Pedda Worloo.

1st. *Atagadal-waree* the plant and *Ata-gadaloo* the grain; of this sort a large proportion is cultivated, probably as much as of all the other sorts put together. It is without awn, the unhusked and husked rice are both white, and of an excellent quality; it requires much water.

2nd. *Yerra-suna-waree* the plant, and *Yerra Sunaloo* the grain. The unhusked and prepared rice is white, and of a very superior quality, no arista, grain long and slender.

3rd. *Kosa-waree* the plant, and *Kosarloo* the grain. The grain is of a light yellowish brown colour, small, awnless, and the cleansed rice, white, and tolerably fine; it requires but

II. 206 little water, and is little cultivated.

5th. *Aksuna-waree* the plant, and *Aksunaloo* the grain. Grain like the last, but the table rice is finer; a large proportion of this is cultivated.

6th. *Krishna-neel-waree* the plant, and *Krishna-neelaloo* the grain. The grain is awnless, very small, dark bluish-black colour. The prepared rice very fine, and white; it is not much cultivated.

This rice is generally boiled in steam, on account of its fineness. It is eaten by the rich only.

7th. *Bangar-tiga*, a large luxuriant sort. Grain white, and awnless; prepared rice white, and tolerably fine, it is much cultivated in the Vizagapatam district.

8th. *Kalee-ganda*. This is also a large luxuriant sort. The grain dark-coloured, awnless. The prepared rice tolerably white, but not fine; it requires but little water.

9th. *Telasuna-waree* the plant, and *Tella sunaloo* the grain. It is a large luxuriant variety. The grain white, awnless; the prepared rice white and fine. It is much cultivated.

There are besides the above, about twenty more varieties of this division, more or less fine, but the principal are those above-mentioned.

2. O. *coarctata. R.*

Panicle contracted; *valvelets* of the calyx subulate. *Leaves* culm-clasping.

A native of the Delta of the Ganges, and first discovered there by Dr. Buchanan in 1796. Flowering time the rainy season.

Root fibrous; and appears to be perennial. *Culms* erect, ramous, jointed, from two to four feet high, smooth, their lower parts seem also perennial. *Leaves* sword-shaped, broadest at the culm-clasping base, tapering to a very fine, long point, smooth, and of a firm texture,

II. unequally divided by the nerve, which is visible on the back only, margins armed with minute

207 prickles. *Sheaths* of the leaves smooth, with ample, waved, fringed mouths, being a continuation of the leaves themselves. *Panicles* terminal, contracted, subcylindric. *Flowers* solitary, pedicelled. *Calyx* of two, minute, subulate valvelets. *Corol* two-valved, smooth; the exterior one boat shaped, and daggered.

I have not been able to learn that any use is made of this sort, nor even to obtain any Asiatic name for it.

LEERSIA. Soland.

Calyx; glume two-valved, one-flowered. *Corol* none.

1. L. *aristata. R.*

Leaves lanceolate. *Panicles* diverging. *Flowers* paired, exterior valve of the calyx awned.

Nir-valli-pullu. *Rheed. Mal.* 10. *t.* 12.

Beng. Junglee dal.

Found growing on the surface of deep, standing, sweet water, in the vicinity of Calcutta, Page Carey Ed.
Flowering time the cold season. Compare with *Pharus aristatus.*

Culms jointed, long, floating on, and in the water; emitting numerous roots from the joints; apices above the water sub-erect. *Sheaths* much longer than the joints, and about as long as the leaves. *Leaves* sheathing, sublanceolate, rather obtuse; cordate at the base; striated and clouded with dark brownish spots above, scabrous. *Panicles* thin. *Flowers* paired on pedicels of very unequal lengths, all hermaphrodite. *Calyx; glume* one-flowered, two-valved; *valvelets* long, hispid, about five-nerved the exterior ending in a pretty long straight arista. *Corol* none. *Nectary* two-leaved, obcordate, crenulate. *Stamens* six. *Germ* ovate. *Styles* two. *Stigmas* plumose.

2. L. *ciliata. R.* II.

Leaves linear-lanceolate, margins backwardly hispid. *Panicles* oblong. *Flowers* solitary, 208
valves of the calyx equal in length, and awnless, but amplyciliate on the back.

Pharus *ciliatus. Retz. obs.* 5. *p.* 23.

A native of Bengal, where it occupies with its primitive roots the margins of pools, lakes, &c. of sweet water, sending forth innumerable, several-fathoms-long, floating stems, and branches over the surface of the water, to a much greater extent than L. *aristata*, which grows in the same manner, but rarely extends more than a few feet. Cattle are fond of the former.

Compare with *Leersia hexandra* of *Swartz*, and *Leersia australis* Brown's Prodromus. In both the foregoing species I have never found the flowers completely hermaphrodite.

HEXANDRIA TRIGYNIA.

RUMEX. Schreb. gen. n. 613.

Calyx three-leaved. *Petals* three, converging. Three-seeded.

1. *R. acutus. Willd.* 2. 253.

Annual (in India.) *Flowers* hermaphrodite, valvelets all grain-bearing, at the flowering time entire, at the fruit time toothed; *verticels* approximate, with most numerous, pedicelled, drooping flowers. *Leaves* lanceolate, entire.

Hind. Jool-pallum.

Beng. Bun-palung.

This plant is common about Calcutta in low places, during the dry season, it perishes as soon as the first rains begin.

Root long, slender, somewhat ramous, annual, externally of a pale yellowish brown colour. II.
Stem erect, ramous, furrowed, otherwise smooth; from one to three feet high. *Leaves* alter- 209
nate, all petioled, lanceolate; the superior or floral leaves linear, and very smooth; all are entire, waved and smooth, from one to twelve inches long. *Petioles* with a trifling membranaceous vagina at the base; *verticels* numerous, approximate, consisting of numerous, drooping, pedicelled flowers. *Calyx; leaflets* linear, small. *Corol*, valvelets ovate-lanceolate, callous grained on the outside; at the flowering time they are entire, and as the seed advances to maturity become toothed on the sides, by which time the grains are very large, oblong-ovate, and with a granulous surface. *Style* short, filiform. *Stigmas* pencil-shaped.

Observation.

This differs from *R. acutus* of Europe in being annual, and I think it may be a different species. I must however leave it to those to point out wherein they differ, who have an opportunity of doing so with the living plants before them. Every part thereof possesses a considerable degree of astringency and bitterness, without any thing like acidity.

2. R. *vesicarius. Willd.* 2. 256.

Flowers hermaphrodite, geminate; all the valves very large, membranaceous, reflexed. *Leaves* undivided.

Sans. Shutavedhee.

Beng. Chooka-palung.

Arab. Humarbostanee.

Pers. Toorshumuk.

Found cultivated in gardens all over Asia, and used by the natives in their food, as well as medicinally.

APONOGETON. Schreb. gen. n. 835.

Calyx, or corol two-leaved. *Capsules* three or four, superior, each containing two, or more seeds. II.

1. A. *monostachyon. Willd.* 2. 917. *Corom. pl.* 1. *N.* 81. 210

Spike single, simple. *Leaves* linear, with cordate base. *Capsules* smooth, with about six seeds in each.

Parua-kelanga. *Rheed. Mal.* 11. *t.* 15.

Sans. Kakangi.

Hind. Ghechoo.

Naina is the Telinga name of the plant, and namadumpa of the root.

Saururus *natans.* Mant. 227.

It is a native of shallow, standing, sweet water; and appears and flowers during the rains.

Page Carey Ed. *Root* tuberous, perennial. *Leaves* radical, long-petioled, linear-oblong, at the base cordate, pointed, entire, smooth, from three to five-nerved, from three to six inches long, and about one broad. *Scapes* as long as the leaves, a little striated, perforated by many pores length-ways. *Spikes* elegantly bent this way and that, closely surrounded with flowers. *Calyx*, or *corol*, which you may please, two wedge-shaped, concave leaflets, or petals, inserted at the base of the two fissures, between the inferior and two superior germs, permanent. *Filaments* always six, shorter than the bractes, withering. *Anthers* blue. *Germs* constantly three, surrounded by the permanent stamens. *Capsules* three, pointed, with a remaining style, smooth, one-celled, from four to eight seeded. *Seeds* oblong, inserted into the base of the capsule.

The natives are fond of the roots, which are nearly as good as potatoes.

I have removed this genus from the fourth order of the seventh class, to the third order of the sixth, as all my four Indian species are uniformly hexandrous, and for the most part with three germs.

2. A. *echinatum. R.*

Spike single, and simple. *Leaves* linear, with cordate base. *Capsules* echinate. *Seeds*
II. about six.
211 Found, with the former species growing in shallow fresh water all over the Circars.

3. A. *undulatum. R.*

Stoloniferous. *Spikes* simple. *Leaves* lanceolate, waved.

A native of Bengal, and like A. *monostachyon*, grows in standing sweet water. It flowers during the rains.

Root tuberous, perennial, stole-bearing and edible. *Leaves* radical, petioled, generally under, or floating on the water, lanceolate, waved, from three to five-nerved, with numerous, small, expanding veins, from four to six inches long, and less than one broad. *Petioles* compressed, shorter than the leaves. *Scapes* round, smooth, the length various, according to the depth of the water, thickening as it ascends. *Spikes* simple, crowded with flowers. *Bractes* and stamens as in A. *monostachyon*. *Germs* three, sometimes four, but this does not affect the number of stamens; in all the flowers I examined, they are invariably six. *Capsules* smooth. *Seed* generally one or two, oblong.

4. A. *microphyllum. R.*

Root tuberous. *Spike* single, simple. *Leaves* radical, cylindric, many times shorter than the spike. *Capsules* with one or two seeds.

A native of damp places near the Bhotan mountains. Flowering time, the rainy season.

Root tuberous, and esculent. *Leaves* radical, sessile, about three, four, or five to the scape, spreading close on the surface of the earth, sub-semicylindric, their margins being incurved; about one inch long, and one eighth of an inch broad. *Scape* erect, round, smooth, three or four
II. times longer than the leaves. *Spathe* caducous. *Spike* terminal, sub erect, every where cover-
212 ed with beautiful blue coloured flowers. *Calyx* (*bractes* or *corol*) two-leaved; *leaflets* wedge-shaped, expanding. *Stamens* uniformly six. *Germs* three. *Capsules* with one, or two round seeds in each.

ANDERSONIA. R.

Calyx three-five-parted. *Corol* petalled. *Nectary* globular, with the sessile anthers affixed to its inside. *Germ* superior, three-celled; cells two-seeded; attachment interior. *Capsules* three-celled, three-valved. *Seeds* solitary, arilled. *Embryo* inverse, without perisperm.

It was named in memory of the late Dr. James Anderson, Physician at Madras. It differs from Cupania in having a three-petalled corol, and globular antheriferous nectary; and from *Guarea and Persoonia* in the *calyx* and *pericarpium*.

1. A. *cucullata. R.*

Polygamous. *Leaves* unequally pinnate; *leaflets* opposite, from two to four pair, obtuse. Hermaphrodite peduncles axillary, few flowered, male panicled.

Beng. Umur.

A tree of considerable size, but of very slow growth, a native of the Delta of the Ganges. Flowering time, the latter part of the rainy season, and the beginning of the cold season.

Trunk in young trees straight, with few *branches;* the bark ash-coloured, and smooth; *young shoots* also smooth. *Leaves* alternate, unequally pinnate, from six to eighteen inches long. *Leaflets* opposite, two, three, or four pair, short-petiolated, obliquely ovate-lanceolate, obtuse, unequally divided by the nerve, polished on both sides, and of a firm texture; *margins* entire, from three to six inches long. The terminal leaflet is often cowled at the base, hence
II. the specific name. *Petioles* nearly round, and pretty smooth. *Stipules* none.
213 Male tree. *Panicles* axillary, solitary, drooping, about as long as the leaves; ramifications numerous, diverging. *Flowers* numerous, small, yellow. *Bractes* a small obscure scale, under each division of the panicle, and two pressing the calyx laterally. *Calyx* small, one-leaved, three-toothed. The two bractes, while they remain, make it appear five-parted. *Petals* three, oval, concave, pressed to the nectary. *Nectary* round, turbinate, with a contracted triangular opening on the apex. *Filaments* none. *Anthers* from six to eight, sessile, round, the inside of the nectary, apparently abortive. *Germ* none, but a clavate gland in its place.

Hermaphrodite tree. *Peduncles* axillary, solitary from three to six-flowered. *Flowers* longer than the male, in other respects the same. *Calyx*, *corol*, and *nectary* as in the male. *Anthers* always six. *Germ* superior, three-sided, ovate, covered with minute, stellate scales, three-celled, with two vertically placed *ovula* in each, attached to the middle of the axis. *Style* none. *Stigma* large, three-lobed; *lobes* somewhat two-lobed. *Capsule* nearly round, as large

as a middling sized apple, three-lobed, three-celled, three-valved. *Cortex* thick, firm, and of a tough, fleshy texture. *Seeds* solitary, of a roundish trigonal shape, three-fourths covered with a fleshy bright orange-coloured aril. *Integument* under the aril smooth, and of a chesnut colour. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed. *Plumula* two-lobed. *Radicle* semilunar, superior. Page Carey Ed.

2. A. *Rohituka. R.*

Polygamous. *Leaves* unequally pinnate; *leaflets* six-paired, obliquely oblong, entire, smooth, opposite. *Inflorescence* axillary, the fertile flowers spiked, the abortive ones panicled.

Sans. Rohituka.

Beng. Tikta-raj.

Hind. Harrin-hara, or khana. II.

These synonyms refer chiefly to the *female hermaphrodite*, or fertile tree. 214

A small tree, a native of Bengal. Flowering time the rainy season.

Trunk pretty straight, covered with smooth, ash-coloured bark. *Branches* not very numerous, but spreading and drooping much, and so densely decorated with leaves, as to yield the most complete shade. *Leaves* alternate, unequally pinnate, from one, to two feet long. *Leaflets* from four, to eight pair, opposite, short-petioled, oblong, and linear-oblong, somewhat falcate, entire, obtusely cuspidate, smooth on both sides; the most exterior are about six inches long, while the lower pair is scarcely half the length. *Petioles* nearly round, and very slightly villous. *Stipules* none.

Male tree. *Panicles* axillary, or rather a little above, shorter than the leaves, composed of numerous, simple, diverging, somewhat drooping ramifications. *Flowers* numerous, subsessile, small, white, inodorous. *Bractes* minute, scales under the divisions of the panicle, and calyx. *Calyx* one-leaved, thick, firm and fleshy. *Border* divided into five nearly equal, imbricate, reniform segments. *Petals* three, oval, concave. *Nectary* globular, pure white, fleshy, smooth, with a roundish triangular opening on the apex. *Filaments* none. *Anthers* six, their back attached to the inside of the nectary. *Germ* abortive.

Hermaphrodite tree. *Spikes* axillary, solitary, peduncled, erect, generally simple, rather more than half the length of the leaves. *Flower* sessile, numerous, small, cream-coloured. *Bractes*, a very minute one below each flower. *Calyx* five-leaved. *Leaflets* orbicular, unequal, leathery, concave, smooth on both sides. *Petals* three, roundish, concave, much longer than the calyx. II. *Nectary* globular, fleshy, perforated at the apex, occupying the whole centre of the corol; in- 215 closing the stamens, and pistil. *Filaments* none, or very short. *Anthers* six, linear, pointed, joined to the inside of the nectary, with their apices just appearing at its perforation, which makes the nectary look as if its mouth was six-toothed. *Germ* three-celled, with two ovula in each, attached to the middle of the axis. *Style* scarcely any. *Stigma* three-lobed; *lobes* emarginate. *Capsule* round, about an inch and a quarter in diameter, smooth, pale yellow, rather soft and fleshy, three-celled, three valved, opening from the apex. *Seeds* solitary, oblong, enclosed in a complete, thick, fleshy, scarlet aril, which is attached length-ways to the three-partible mouth of the capsule, and this again to a light coloured mark on the *inner* edge of the seed, and round its apex. *Integuments* two; *exterior* the colour, polish, and consistence of the chesnut; the *inner* one lighter coloured, thin and firmly attached to the cotyledons. *Perisperm* none. *Embryo* inverse, minute, until vegetation has taken place. *Cotyledons* conform to the seed, and so firmly and completely united, as to seem one, until the two-lobed *plumula*, and superior radicle, are considerably advanced.

From the seeds of this species, the natives, where the trees grow plentifully, extract an oil, which they use for various economical purposes.

HEXANDRIA HEXAGYNIA.

DAMASONIUM. Schreb. gen. n. 624.

Spathe superior. *Perianth* superior, three-leaved. *Corol* three-petalled. *Germ* lanceolate, from six to twelve-celled; *cells* many-seeded; attachment septal. *Styles* equalling in number the cells of the germ. *Capsule* one-celled, six-valved. *Seeds* numerous. *Embryo* minute; direction various; perisperm ample. II.

1. D. *indicum. Willd.* 2. 276. *Corom. pl.* 2. *N.* 185. 216

Ottel-ambel. *Rheed. Mal.* 11. *t.* 46.

Beng. Parmi-kulla.

Teling. Neer-venekee.

An annual plant, a native of sweet water. Flowering time the rainy season.

Root fibrous. *Leaves* radical, petioled, from oblong-cordate to broad-cordate, waved, from seven to eleven-nerved, smooth, of a thin membranaceous texture; size very various, say six inches each way; they generally grow under the water. *Petioles* three-sided, length various. *Peduncles* radical, with the petioles, of sufficient length to raise the flower above the surface of the water, from four to five-sided, smooth, one-flowered. *Calyx*, spathe, superior, one-leaved, from five to six winged; *wings* membranaceous, waved; mouth five or six-toothed. *Perianth* superior, three-leaved; *leaflets* lanceolate, three-nerved. *Corol* three-petalled. *Nectary* three small, obcordate scales within the insertion of the petals. *Filaments* from six to twelve, erect. *Anthers* linear, erect. *Germ* within the belly of the spathe and inferior to the perianth, from six to twelve-celled, each containing numerous ovula attached to the partitions, as in *Nymphea*. *Styles* from six to twelve, half two-cleft. *Stigmas* acute. *Capsule* oblong, crowned with the withered perianth, six-grooved; one-celled, six-valved. *Seeds* numer-

Page Carey Ed. ous, affixed to six sharp keels, (*parietal receptacles,*) running on the inside of the sutures of the six valves.

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CLASS VII.

HEPTANDRIA MONOGYNIA.

PISONIA. Schreb. gen. n. 1603.

Calyx campanulate, five-toothed. *Corol* none. *Seed* solitary, involved in the enlarged, bacciform calyx. *Embryo* erect, embracing a central perisperm.

1. P. *aculeata. Willd.* 2. 283. *Gært. Sem.* 1. 367. *t.* 76.

Dioecous, shrubby, scandent. *Thorns* axillary, recurved. *Leaves* oblong. *Panicles* axillary.

Beng. Baghachura.

Tam. Karu-indu.

Tragularia *horrida*, of *Konig. M. S. S.*

Teling. Kunki-pootri.

A very common, strong, large, straggling shrub.

Trunk scarcely to be distinguished. *Bark* smooth, dark-olive-coloured. *Branches* numerous, nearly opposite, decussate, horizontal, extending far; young parts downy. *Thorns* axillary, solitary, recurved, very sharp, and strong. *Leaves* sub-opposite, petioled, oval, obtuse, a little downy. *Flowers* collected on small, rigid, terminal, and axillary panicles.

Male. *Calyx*, bell-shaped, five-toothed, five-angled, somewhat scabrous. *Corol* none. *Filaments* seven or eight, twice the length of the calyx, inserted into a fleshy receptacle, which surrounds the base of the abortive germ. *Anthers* simple. *Germ* lanceolate, abortive.

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Female. *Calyx* as in the male. *Corol* none. *Stamens* none. *Germ* superior, conical. *Style* longer than the calyx. *Stigma* headed. *Pericarp* none, the calyx now enlarged, and contracted at the mouths serves for one. It is five-sided, each angle being armed with two or three rows of conical, headed, very glutinous glands. *Seeds* one, nearly cylindric, &c. as described by Gærtner.

It makes most excellent, impenetrable fences, and when fairly caught in its trammels it is no easy matter to be extricated, the prickles being so numerous, strong, crooked, and sharp. Both Konig and myself were so situated amongst the Vandalore hills near Madras, and hence he named it T. *horrida*, not at that time suspecting it to be *Pisonia aculeata*.

Plants received from the West Indies into the Botanic garden at Calcutta, do not in any respect differ from our East Indian one, which grows common in forests, hedges, &c.

JONESIA. R.

Calyx two-leaved. *Corol* infundibuliform, the tube fleshy and closed, border four-parted. *Nectary*, a staminiferous and pistiliferous ring crowning the mouth of the tube. *Germ* pedicelled. *Legume* turgid, from four to eight-seeded.

J. asoca, R. in Asiat. Res. 4. 355.

Leaflets five pair, lanceolate. *Flowers* heptandrous.

Jonesia *pinnata. Willd.* 2. 287.

Asoca. *Asiat. Res.* 3. 254. *and* 4. 274.

Asjogam. *Rheed. Mal.* 5. *p.* 117. *tab.* 59.

Beng. Usok.

Found in gardens about Calcutta, where it grows to be a very handsome, middling sized, ramous tree; flowering time the beginning of the hot season; the seeds ripen during the rains.

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The plants and seeds were probably brought originally from the eastern frontier of Bengal, where it is indigenous.

Trunk erect, though not very straight. *Bark* dark brown, pretty smooth. *Branches* numerous, spreading in every direction, so as to form a most elegant, large shady head. *Leaves* alternate, abruptly pinnate, sessile, generally more than a foot long; when young, pendulous, and coloured. *Leaflets* opposite, from four to six-pair, the lower pairs broad-lanceolate; the superior lanceolate; all are smooth, shining, and of a firm texture, with their margins a little waved. Common *petioles*, round, smooth. *Stipules* axillary, solitary, in fact a process from the base of the common petiole, as in many of the grasses. *Cymes* terminal and axillary, between the stipule and branchlets, nearly globular, large, and crowded with flowers. *Bractes* a small, cordate, one under each division, and subdivision of the cyme. *Peduncles*, and *pedicels* smooth, and reddish-coloured. *Flowers* numerous, pretty large; when they first expand, they are of a beautiful orange colour, gradually changing to red, forming a variety of beautiful shades, fragrant during the night. *Calyx* two-leaved; *leaflets* nearly opposite, coloured, cordate, bracte-like, marking the termination of the pedicel, or the beginning of the tube of the corol. *Corol* one-petalled, funnel-formed. *Tube* slightly incurved, firm, and fleshy, tapering towards the base, and impervious. *Border* four-parted; *divisions* spreading, suborbicular, one-third the length of the tube; *margin* slightly woolly. *Nectary*, a staminiferous, and pistiliferous, crenulated ring crowning the mouth of the tube. *Filaments* generally seven, and seven must, I think, be the natural number; viz. three on each side, and one below;

Page Carey Ed. II. 220

above a vacancy, as if the place of an eight filament, occupied on its inside by the pedicel of the germ; the filaments are equal, distinct, ascending, and about three, or four times longer than the border of the corol. *Anthers* reniform, small, incumbent. *Germ* oblong, pedicelled; *pedicel* inserted into the inside of the nectary, immediately below the vacant space already mentioned, one-celled, from eight to twelve-seeded, attached to the upper margin of the cell. *Style* nearly as long as the stamens, declining. *Stigma* simple. *Legume* scimitar-shaped, turgid, on the outside reticulated, otherwise pretty smooth, from six to ten inches long, and about two broad. *Seeds* generally from four to eight, smooth, gray, the size of large chesnut.

Note. Many of the flowers have only the rudiment of a pistilium.

When this tree is in full blossom, I do not think the whole vegetable kingdom, affords a more beautiful object.

2. *J. scandens. R.*

Shrubby scandent, or twining. *Leaflets* two or three pairs.

A native of Sumatra, and has been received into the Botanic garden at Calcutta, but has not yet blossomed there. Sir William Jones, whose name this genus bears, mentions (*Asiat. Res.* 4. 275.) a twining species, to which Jayadeva gave the epithet voluble which is probably a fourth species, if not this.

3. *J. triandra. R.*

Leaflets two pair, oval. *Flowers* triandrous.

A native of the Malay Archipelago.

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CLASS VIII.

OCTANDRIA MONOGYNIA.

XANTHOPHYLLUM. R.

Calyx five-leaved. *Corol* five-petalled, sub-papilionaceous. *Germ* superior, one-celled, few-seeded, attached to two opposite parietal receptacles. *Berry* one-seeded. *Embryo* transverse, without perisperm.

1. X. *virens. R.*

Panicles interfoliaceous and terminal. *Germ* four-seeded.

Beng. Gundee.

A large timber tree, a native of the thick forests of Silhet, where it blossoms in March and the seed ripens in June and July. The wood is said to be remarkably hard and useful to the natives.

Branches and *branchlets* very numerous, and much crowded, smooth. *Leaves* alternate, short-petioled, from oblong to lanceolar, entire, of a firm texture, and polished; about six inches long, and from one and a half to two and half broad. *Stipules* none. *Panicles* terminal, and between the leaves, internodal, very numerous and pretty much crowded with flowers; in general they are shorter than the leaves, and every part is smooth. *Flowers* numerous, rather small, colour a mixture of yellow and pink, generally solitary, pretty long-pedicelled. II. 222 *Bractes* tern, at the base of each solitary pedicel, small, ensiform, villous, caducous. *Calyx* five-leaved, rather unequal, the lower two, and the superior one being smaller. *Petals* five, the superior and lateral four nearly equal, sub-spatulate, falcate; the upper two from what may be called the vexillum; the fifth or lower, *(carina,)* boat-shaped, unguiculate, and pink-coloured. *Filaments* eight, incurved, nearly equal, shorter than the corol, and hairy; four of them inserted on the claws of the upper four petals, two on the claw of the lower, viz. the carina, and the remaining two into the receptacle, between the two petals which form the *vexillum* and the two *wings*. *Anthers* oval. *Germ* superior, short-pedicelled, the insertion of which is embraced by a seven-angled, nectarial cup, round, ribbed, a little hairy, one-celled, containing four *ovula*, attached two and two to two opposite sub-parietal receptacles, near the base of the cell. *Style* the length of the stamina, toward the apex incurved. *Stigma* slightly two-cleaved. *Berry* globular, short-pedicelled, of a firm fleshy texture, when ripe, olive-coloured, and about the size of a pigeon's egg, one-celled. *Seed* solitary, nearly round; *attachment* lateral. *Integument* single, rather thick and brownish. *Perisperm* none. *Embryo* transverse, green. *Cotyledons* two, conform to the seed, equal. *Radicle* lateral, truncate, lodged immediately within the umbilicus of the seed, and pointing to it.

2. X. *flavescens. R.*

Panicles axillary and terminal. *Germs* from eight to ten-seeded. Two glands on the back of the leaves near the base.

Beng. Ajensak.

A large tree, a native of the hilly parts of the province of Chittagong, where it blossoms in May, and is so very much like the former species, *virens*, that I was for some time inclined II. 223 to consider them only varieties of one species, but attentive examinations made at various times, give me reason to think they are sufficiently distinct. In the former, *virens*, the leaves continue green when dry, and are destitute of the two small, hollow glands on the base of the lower pair of veins, one on each of the lower ends of the rib, or nerve, which particularly mark *flavescens*. The *panicles* except those that terminate the twigs, are in this perfectly axillary; in that far above the axilla, and their insertion accompanied by two or three vertically situated *knobs* or buds, as in some species of *Capparis*, &c. There the *germ* has never more than four *ovula*, in-

Page Carey Ed. serted by pairs on opposite sides near the bottom of the cell; here are from eight to twelve *ovula* in the germ, inserted on opposite sides of the cell, from the base to near the top. There the stigma is large and more or less two-lobed; here simple. In other respects they agree so well, that it seems unnecessary to figure more of *flavescens*, than the back of the base of one leaf, to shew the two glands.

OSBECKIA. Schreb. gen. n. 635.

Calyx from four to five-cleft; *lobes* separated with a fringed scale. *Corol* from four to five-petalled. *Anthers* beaked. *Capsule* four-celled, girt with the tube of the calyx.

1. O. *zeylanica. Willd.* 2. 300.

Annual, bristly. *Leaves* petioled, oblong, bristly. *Flowers* axillary, and terminal.

A native of Ceylon.

Stem annual, erect, four-sided, the angles armed with erect bristles. *Branches* opposite,
II. stem-like; whole height about one foot. *Leaves* opposite, short-petioled, oblong, entire, fring-
224 ed, bristly on both sides. *Flowers* axillary, and terminal; those of the axils solitary, and short-peduncled; the terminal from one to five, or seven together, and still shorter peduncled, a large, beautiful bright blue-purple. *Bractes* fringed. *Calyx* bristly; intermediate scales consisting of a pedicelled star of bristles each.

2. O. *chinensis. Willd.* 2. 300.

Annual, erect, four-seeded, scabrous. *Leaves* sessile, lanceolate, three-nerved. *Flowers* terminal, subsessile, four smaller divisions of the calyx fringed.

Found in Cuttack, on dry rice fields, in flower during the cold season.

3. O. *tetrandra. R.*

Shrubby, scandent. *Leaves* opposite, three-nerved. *Panicles* terminal. *Flowers* tetrandrous.

A large, climbing shrub, a native of Pulo Pinang. Tendrils few, scattered, solitary, undivided.

Leaves opposite, short-petioled, three-nerved, cordate-oblong, entire, smooth on both sides; a marginal vein runs round the leaves, which gives them the appearance of being five-nerved. *Petioles* short, bristly on the upper side. *Panicles* terminal, cross-armed, conical; divisions thereof trichotomous. *Calyx* one-leaved. *Tube* gibbous, permanent. *Border* four-parted, deciduous. *Petals* four, alternate with the stamens, long-clawed, crescent-shaped, fringed, each having a long spur projecting downward from the inside. *Filaments* four, inserted into the calyx. *Anthers* erect; before expansion their points are lodged in four deep pits between the calyx and germ, with long perforated beaks and two small scales at the base of each on the inside. *Germ* hidden within the calyx. *Style* awled. *Stigma* simple. *Capsules* roundish, crowned with the entire tube of the calyx, four-celled; *cells* opening at top. *Seeds* very numerous. *Receptacle* semilunate.

II.
225

Observation.

This plant appears to me to be nearly allied to *Osbeckia*, however the want of the intermediate small scales of the calyx, and there being only four stamens, are I think sufficient motives for doubt. Compare with *Melastoma*, also with *Rhexia*.

New genus (Blank.)

Calyx entire. *Corol* four-petalled, inserted on the calyx. *Capsule* inferior, four-celled; *receptacles* parietal. *Seeds* numerous.

Leaves opposite, short-petioled, ovate-oblong, entire, pointed, three-nerved, smooth on both sides. *Corymbs* terminal, and axillary, much shorter than the leaves, crowded, decompound. *Flowers* numerous, small. *Bractes* minute. *Calyx* entire. *Petals* four, contorted, ovate-cordate, subsessile, expanding, inserted in the mouth of the calyx. *Filaments* eight, the length of the petals, inserted into the calyx under the petals, points incurved and fine. *Anthers* crescent-shaped, with a double polleniferous groove on the inside. *Germ* inferior, roundish, small. *Style* the length of the stamens. *Stigma* clavate. *Capsule* four-celled, four-valved, crowned with the remaining calyx. *Seeds* numerous, affixed to four, callous, vertical parietal receptacles, as in *Vallisneria*, &c.

COMBRETUM. Schreb. gen. n. 641.

Calyx superior, from four to five-toothed. *Corol* from four to five-petalled, inserted with the stamina into the mouth of the *calyx*. *Germ* one-celled; *ovula* from two to four; attachment superior. *Seeds* solitary, from four to five-winged, or lobed. *Embryo* inverse,
II. without perisperm.
226 1. C. *ovalifolium. R.*

Scandent. *Leaves* opposite, oval, smooth, obtuse. *Spikes* axillary and terminal, the latter compound. *Calyx* subrotate. *Petals* elliptic.

A native of Coromandel. Flowering time in the Botanic Garden at Calcutta March and April. The *seeds* ripen during the rainy season.

Stem stout, and ligneous, soon dividing into numerous, woody, scandent branches and branchlets of great extent. *Bark* of the old parts rough, and brown; of the young shoots smooth. *Leaves* opposite, short-petioled, oval, entire, obtuse, smooth on both sides; from four to six inches long, and two to three broad. *Stipules* none. *Spikes* terminal and axillary; the former compound, having two, or three pairs of opposite, expanding branches, and

may be called a panicle. *Bractes* minute, subulate, one-flowered. *Flowers* small, yellowish white, sessile. *Calyx* without a tube, concave within, and there the rim is surrounded with a large, orange-coloured, hairy ring; *border* four-parted; *segments* three, angular, reflexed. *Petals* elliptic, obtuse, longer than the segments of the calyx, smooth, white. *Filaments* longer than the petals, incurved, alternately somewhat shorter. *Germ* inferior, oblong, one-celled, containing two *ovula*, attached to the top of the cell. *Style* shorter than the stamina. *Stigma* simple. *Seed* narrow-lanceolar, four-winged; wings semilunar, smooth, membranaceous. *Integuments* two; interior thin, and brown. *Perisperm* none. *Embryo* inverse. *Cotyledons* intricately folded into the four lobes of the seed, when expanded two-lobed, as in most of the *Convolvulacea*. *Radicle* superior. Page Carey Ed.

2. C. *rotundifolium*. *R.*

Scandent. *Leaves* opposite, petioled, nearly round, smooth, entire. *Racemes* axillary, solitary, cylindric, dense. *Flowers* pedicelled; *calyx* narrow-campanulate; *petals* obcordate. II. 227

Cou-*luta* the vernacular name in Silhet, where it is indigenous. Flowering in January and February.

Stem and *branches* scandent; the young shoots often twining. *Leaves* opposite, or nearly so, petioled, subrotund, entire, smooth; from three to five inches long, and nearly as broad. *Petioles* about an inch long. *Racemes* axillary, solitary, long-peduncled, short, cylindric, crowded with numerous, small, straw-coloured, pedicelled flowers. *Bractes* subulate, one-flowered, caducous. *Calyx* narrow-campanulate, four-toothed. *Petals* four, obcordate, and about as long as the teeth of the calyx. *Filaments* eight, long and slender, just under the insertion of each is a hairy gland. *Germ* lanceolar, four-sided, one-celled, containing two *ovula* attached to the top of the cell.

3. C. *costatum*. *R.*

Scandent. *Leaves* opposite, oblong, smooth, veins single and parallel. *Spikes* axillary, single, or paired; *calyx* cup-shaped; *petals* lanceolar, minute.

Tali *joonia*r the vernacular name in Silhet, where it is indigenous, and like the other East India species, a large, scandent shrub. Flowering time March and April.

Branchlets opposite, or dichotomous, round, and smooth. *Leaves* opposite short-petioled, oblong, taper-pointed, entire, smooth on both sides; veins simple and parallel; about six inches long, and three broad. *Stipules* none. *Spikes* axillary, and terminal, single, or in pairs, subsessile, from one to two inches long. *Flowers* numerous, scattered, small, dull yellow. *Bractes* minute, one on the under side of each germ. *Calyx* cup-shaped, obscurely four-toothed, pretty smooth and even on both sides. *Petals* four, very small, lanceolar. *Filaments* eight, smooth, many times longer than the calyx, and inserted into it. *Anthers* two-lobed. *Germ* inferior, one-celled, containing two, three, or four *ovula*, attached to the top of the cell. *Style* nearly as long as the stamina. *Stigma* acute. II. 228

4. C. *acuminatum*. *R.*

Scandent. *Leaves* opposite, and alternate, subsessile, ovate-lanceolate, acuminate, with a cordate base. *Spikes* axillary, and terminal. *Calyx* campanulate, a very hairy belt within. *Petals* subrotund.

Patj*ooni*. the vernacular name in Silhet, where it is found wild in the forests, running over trees, &c to a great extent. Flowers in March and April; seed ripe in July.

Young shoots downy. *Leaves* subopposite, and alternate, subsessile, from oblong to ovate-lanceolate, entire; base cordate; *apex* alternate and acute; upper surface pretty smooth, villous underneath; from four to six inches long, and from one to three broad. *Spikes* axillary and terminal, peduncled, shorter than the leaves, villous. *Flowers* numerous, sessile, small, yellow. *Calyx* campanulate; *mouth* acutely four-toothed, round the inside just below the insertion of the filaments, is a very hairy, membranaceous ring, with the lower hairs thereof pointing down, while those above point up through the mouth of the tube, and are straw-coloured. This hairy valve, or membrane, will immediately point out this species. *Petals* four, round-oval, yellow. *Stamina* eight. *Germ* ovate, one-celled, containing three or four *ovula*, attached to the top of the cell. *Style* length of the stamina. *Stigma* simple. *Seed* oblong, four-cornered, the four sides grooved; angles thick and rounded, smooth, dark brown and dry. *Integuments* two, no perisperm. *Embryo* inverse, with the large *cotyledons* most intricately folded as in the *Convolvulaceæ*, and not expanding, or rising above ground during vegetation. II. 229

5. C. *extensum*. *R.*

Shrubby, climbing and twining to a great extent. *Leaves* opposite, oblong, smooth, entire. *Spikes* lateral, often compound, short-peduncled, ovate. *Calyx* infundibuliform, smooth; *divisions* acute. *Petals* truncated.

A most extensive, stout, woody, twining, and climbing plant, with smooth brown bark; a native of the Malay Islands. From Amboyna it has been introduced into the Botanic Garden at Calcutta, where it blossoms in January and February; seed ripe in April.

Leaves opposite, short-petioled, oblong, entire, firm and polished, about six inches long, and about three broad. *Spikes* lateral, and axillary; the first from the former years branches, below the leaves, short-peduncled, often compound much shorter than the leaves, ovate, and closely covered with diverging, small, pale greenish white flowers, becoming reddish by age. *Bractes* most minute, one-flowered. *Calyx* funnel-shaped; *border* of four, triangular, recurved, acute, divisions. *Petals* four, not half the length of the divisions of the calyx, ovate-truncate, but as the edges become revolute, they then appear acute. *Filaments* eight, inserted into the mouth of the calyx, and longer than the divisions of its border. *Anthers* roundish, orange-coloured. *Germ* inferior, linear-oblong, one-celled, containing two, three, or four seeds attached to the top of the cell. *Style* so long as to elevate the *stigma* even with the anthers.

Page Carey Ed. II. 230

Seed always single, and with Gærtner, I consider the exterior integument thereof all there is for a *seed vessel*, which is of a lanceolate shape, with four grooves on the four sides, and the four angles extended into four, large, scariose, semilunar wings. *Inner integument* more spongy and entering into the four angular grooves formed by the foldings of the lobes. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, oval, three-nerved, emarginate, plaited into each other. *Plumula* minute. *Radicle* clavate, superior, pointing directly to the convoluted cord, which attaches the inner integument to the outer, under the style.

6. C. *chinensis. R.*

Subarboreous, scandent. *Leaves* opposite, and tern, oblong, smooth. *Spikes* axillary, shorter than the leaves. *Tube* of the calyx clavate, mouth shut with hairs.

A very large, spreading, ramous, scandent plant, in the Botanic Garden at Calcutta; originally from China.

Flowering time in Bengal the beginning of the cold season.

Trunk scarcely any, but numerous branches, spreading in every direction and climbing when supported, to the extent of some fathoms. *Bark* dark brown; and pretty smooth. *Leaves* opposite, and tern, petioled, drooping, entire, oblong, polished on both sides; about four inches long, and two broad. *Spikes* axillary, solitary, simple, erect, subcylindric, compact, scarcely half the length of the leaves, bearing sessile flowers on all sides. *Bractes* subulate, recurved. *Calyx. Tube*, clavate; mouth shut with hairs; *border* of four, acute segments. *Petals* obovate, acuminate, twice longer than the segments of the calyx. *Stamens* eight, a little longer than the petals. *Germ* sessile. *Style* nearly equalling the filaments. *Seed* with four large wings.

This is evidently different from C. *secundum* and *decandrum* but to distinguish it from *laxum*, requires that attention to be paid to the three-fold leaves; the form and length of the spikes, the size of the petals, and the length of the filaments. *Vide Jacquin. Stirp. Amer.* II. *p.* 103. 4-5.

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7. C. *macrophyllum. R.*

Scandent, smooth. *Leaves* opposite, ovate. *Racemes* axillary, subcylindric, dense and crowded. *Calyx* infundibuliform. *Segments* acuminate. *Petals* oval.

A very extensive, powerful rambler, a native of Chittagong, where it blossoms in December. It is readily distinguished by the flowers being pedicelled, and while in the bud acutely conical, also within is a hairy rim round its mouth, below the eight stamina. The larger leaves are about a foot long, and from six to eight inches broad.

8. C. *squamosum. R.*

Scandent; all the tender parts covered with minute scales. *Leaves* opposite short-petioled, oblong, entire, acute. *Panicles* terminal, and axillary. *Petals* lanceolar.

A native of the Malay Archipelago.

9. C. *laxum. Willd.* 2. 319.

Scandent. *Leaves* oval. *Racemes* lengthened, thin of flowers and without bractes. *Calyx* woolly within.

Teling. Bandikota.

A native of the Northern Circars, but I doubt whether it be the same as the American species with the same specific name.

10. C. *pilosum. R.*

Scandent. *Leaves* opposite, ovate-lanceolate. *Panicles* uncommonly dense and hairy. *Flowers* hairy, decandrous. *Petals* lanceolar.

Beng. Jooni-ugur.

A native of the Silhet district, and like the other Indian species, an extensive, very permanent, large scandent species with the more slender branches twining. *Bark* of the ligneous parts pretty smooth, dark brown; that of the younger shoots clothed with much ferruginous, soft pubescense. II. 232

Leaves opposite, subsessile, broad ovate-lanceolate, entire, nearly smooth, as scarcely any thing more than the nerve and veins on the underside are slightly pubescent; six or eight inches long, and from one to three broad. Floral leaves small, broader in proportion, more pointed, and somewhat coloured. *Panicles* terminal or short, with opposite, diverging, hairy branchlets, very large, crowded with opposite, brachiate, compound racemes, and those again crowded with opposite flowers, bractes, and small floral leaves; every part densely clothed with much ferruginous hair. *Flowers* tawny, with ferruginous hairs, short-pedicelled. *Bractes* linear-lanceolar, opposite, one-flowered. *Calyx* superior, campanulate, five-toothed, both sides hairy. *Petals* five, lanceolar, much longer than the segments of the calyx, outside clothed with appressed fulvous hairs. *Filaments* ten, much longer than the corol, five inserted immediately under the petals, and five deep in the tube of the calyx. *Germ* five-angled, hairy, one-celled, containing two *ovula*, attached to the top of the cell. *Style* length of the stamina. *Stigma* simple. *Seed* five-winged, villous. *Integuments* two. The *exterior* is the soft, villous winged tunic; the *inner* a thin dark brown membrane, adhering to the *cotyledons*. *Perisperm* none. *Embryo* inverse. *Cotyledons* angularly-convolute. *Radicle* superior.

11. C. *decandrum. Willd.* 2. 319. *Corom. pl.* 1. *N.* 59.

Shrubby, climbing. *Leaves* opposite, oblong, smooth, floral leaves coloured, and villous. *Spikes* terminal, and axillary; *flowers* decandrous. *Capsules* five-winged.

Teling. Arikota.

It is a large, climbing shrub, a native of forests and mountains, &c. Flowers during the cold season. II. 233

Stem woody, climbing. *Leaves* opposite, reflected, short-petioled, oblong, acute, waved, smooth, about six inches long, and three broad. *Floral* leaves small, coloured, downy. *Spikes*

numerous, terminal and axillary. *Bractes* opposite, lanceolate, one-flowered. *Calyx* campanulate, five-toothed. *Corol* five-petalled. *Stamens* ten. *Seed* five-winged. Page Carey Ed.

12. C. *purpureum. Willd.* 2. 319. *Vahl. Symb.* 3. 51.

Scandent. *Leaves* opposite, broad-lanceolate, glossy, underneath purple. *Spikes* panicled, terminal, flowers decandrous.

Cristaria coccinea. *Sonnerat. it.* 2. 247. *t.* 140.

A native of the Mauritius, from thence introduced into the Botanic garden at Calcutta.

GRISLEA. Schreb. gen. n. 642.

Calyx from four to six-toothed. *Corol* from four to six-petalled, inserted into the fissures of the calyx. *Filaments* long, ascending. *Capsule* superior, two-celled. *Seeds* numerous.

G. *tomentosa. Willd.* 2. 321. *Corom. pl.* 1. *N.* 31.

Shrubby. *Leaves* opposite, stem-clasping. *Racemes* axillary. *Petals* minute; *stamina* eleven, or twelve.

Lythrum *fructicosum. sp. pl.* 641.

Dhawry. *Asiat. Res.* 4. *p.* 42.

Sans. Agnijwala, and Dhatree.

Teling. Seringir.

Beng. Dhau-phool.

A very beautiful, flowering shrub, or small tree, a native of the hills and vallies through the northern Circars, &c. &c. It flowers during the cold, and the beginning of the hot season, and the seed ripens in the rains.

Stem and principal *branches* erect, smaller ascending. *Bark* rust-coloured; *twigs* drooping. II. *Leaves* opposite, in a position between decussate and bifarious, stem-clasping, lanceolate, with 234 cordate base, acute, above smooth, whitish underneath. *Racemes* axillary and below the leaves, over the leafless branchlets, often compound, short, bearing from five to fifteen flowers. *Flowers* pretty large, red, in a great measure permanent. *Calyx* red, twelve-toothed, the alternate ones very small, permanent, as is also the colour. *Petals* six, small, linear, lanceolate. *Filaments* twice the length of the calyx, alternately a little shorter, ascending, inserted into the calyx near its base, and projecting along its under side. *Germ* superior, two-celled. *Style* shorter than the stamens. *Stigma* bifid. *Capsule* two-celled, two-valved, covered with the coloured permanent calyx. *Seeds* most numerous. *Receptacles* reniform, large.

Note. The bright red, permanent calyx, which retains its colour till the seeds are ripe, gives to this shrub a very gaudy appearance.

ROXBURGHIA. Banks.

Calyx four-leaved. *Corol* four-petalled, their lower half carinated on the inside. *Anthers* sessile in the grooves formed by the carinas of the petals. *Germ* superior, one-celled, many-seeded; attachment inferior. *Capsule* superior, one-celled, two-valved. *Seeds* several, each sitting on a spongy receptacle.

R. gloriosoides. Willd. 2. 321. *R. Corom. pl.* 1. *N.* 32.

Teling. Kanipoo-tiga.

Ubium Polypoides. *Rumph. Amb.* 5. *p.* 364. *t.* 129.

Compare with *Stemona tuberosa. Lourier. Cochin Ch. p.* 490.

This elegant plant is a native of moist vallies up amongst the Circar mountains. Flowering time the cold season. II.

Root perennial, compounded of many, smooth, cylindric, fleshy tubers, of from six to 235 twelve inches long, and from three to five in circumference about the middle; they taper equally towards each end. *Stems* perennial, or more, twining, smooth, running over trees, &c. Branches like the stem, round, smooth, and slender. *Leaves* sometimes alternate, sometimes opposite, petioled, nearly depending, cordate, fine-pointed, entire, smooth, shining, in substance soft and delicate, generally eleven-nerved, with beautiful very fine, transverse, veins running between the nerves; from four to six inches long, and from three to four broad. *Petioles* slightly channelled, smooth; one and a half and two inches long. *Peduncles* axillary, single, erect, the length of the petioles, generally two-flowered. *Pedicels* clubbed, short. *Bractes* one, lanceolate, at the base of the pedicells. *Flowers* large, and beautiful, but fœtid. *Calyx* four-leaved; leaflets lanceolate, membranaceous, striated, coloured, revolute, placed immediately below the petals. *Corol*: *petals* four, nearly erect, lanceolate, the lower half is rather broader than the upper, and along its inside runs a deep, sharp, slightly waved keel, which forms on each side of it, a deep groove, or hollow; these four keels converge, and in some measure adhere together, which brings the side of the petals close so as to resemble a tube; the upper part of the petals is narrow, first bending out a little, then converging at their points. *Nectary* composed of four, lanceolate, yellow bodies, each sitting sessile on the apex of the keel of the petals, converging into one conical dome. *Filaments* none. *Anthers* eight, linear, lodged in the grooves formed by the keel of the petals, adhering their whole length, but their chief insertion is near the base. *Germ* superior, cordate, compressed, one-celled; *ovula* many, attached to the bottom of the cell, cordate. *Style* none. *Stigma* pointed. *Capsule* ovate, compressed, II. one-celled, two-valved, opening from the apex; it is about an inch and a half long, and one 236 broad. *Seeds* from five to eight, inserted by pedicels into the bottom of the capsule, cylindric, striated; the *pedicels* are surrounded with numerous, small, pellucid vesicles.

Note. This was one of the last plants Dr. Konig saw. It was brought in when he was on his death bed; he did attempt to examine it, but was unable, the cold hand of death hung

Page Carey Ed. over him; he desired I would describe it particularly, for he thought it was uncommonly curious, new, and beautiful. This observation, from a worthy friend, a preceptor, and predecessor, has made me more than usually minute in describing and drawing it.

MIMUSOPS Schreb. gen. n. 644.

Calyx from six to eight-leaved, alternately smaller. *Corol* one-petalled, segments many in a double series, with alternate scales on the inside. *Germ* superior, from six to eight-celled, cells one-seeded; attachment interior. *Berry* one or more seeded. *Embryo* erect, and furnished with a perisperm.

1. M. *elengi. Willd.* 2. 325. *R. Corom. pl.* 1. *N.* 14.

Leaves alternate, short-petioled, oblong, pointed, waved, smooth.

Bacula. *Asiat. Res.* 4. *p.* 273.

Elengi. *Rheed. Mal.* 1. *t.* 20.

Beng. Bokul.

Hind. Mulsari.

Teling. Pagadoo.

Tam. Magadoo.

The Kunki of the native Portuguese.

I have only once found this tree in its wild state. It was on the mountains in Rajamun-
II. dree Circar, where it grows to be a middle-sized tree. On account of its fragrant flowers, it is
237 very generally reared in the gardens of the natives, as well as in those of the Europeans in India. It flowers chiefly during the hot season.

Trunk erect, generally from eight to twelve feet to the lowest branches. *Bark* pretty smooth. *Branches* exceedingly numerous, spreading, with the extremities ascending so as to form a most elegant, globular thick head. *Leaves* alternate, short-petioled, approximated, declined or depending, waved, very firm, both sides of a deep shining green; from three to four inches long and one or one and a half broad. *Stipules* small, lanceolate, concave, rusty, caducous. *Peduncles* axillary, from one to eight, short, clubbed, bowing, undivided, one-flowered. *Flowers* middle-sized, drooping, white and fragrant. *Calyx* inferior, eight-leaved, in a double series; *leaflets* lanceolate, the four exterior ones leathery, larger, and permanent. *Corol* one-petalled. *Tube* very short, fleshy. *Border;* it may be divided into a double series of segments, and a single nectary, or a single series of segments, and a double nectary; the first method I shall follow. I therefore consider the border to be composed of a double series of segments; the *exterior* one consists of sixteen, spreading; the *interior* one of eight, generally contorted, and converging, all are lanceolate, a little torn at their extremities. *Nectary* eight-leaved, conical, ragged, hairy near the base, inserted alternately with the filaments, into the mouth of the tube, converging. *Filaments* eight, short, hairy. *Anthers* linear, sharp-pointed, below two-parted, converging. *Germ* eight-celled, with one *orula* in each attached from their middle to the lower end of the conic axis. The germ of *Achras Sapota* is exactly the same, only from eight to ten-celled. *Berry* oval, smooth, when ripe yellow, and edible, one or more celled, according to the number of seeds that ripen, which is generally one. *Seed* solitary, oblong,
II. compressed; attached to the bottom of the cell; covered with a smooth, hard, thick integu-
238 ment, lined with a veined membrane. *Perisperm* conform to the seed, two-lobed, pointed at the base, the lobes uniting round the radicle; above the radicle they are often entirely divided by the large cotyledons, which extend to, or rather through its margins. *Embryo* erect. *Cotyledons* large, oval. *Plumula* minute. *Radicle* inferior, linear-oblong.

2. M. *Kanki. Willd.* 2. 326.

Leaves scattered, petioled, about the ends of the branchlets, obovate-oblong, obtuse, hoary underneath. Fruit oval, drooping.

Flowers hexandrous.

Metrosideros macassarensis. *Rumph. Amb.* 3. *t.* 8.

Manil-kara. *Rheed. Mal.* 4. *t.* 25.

Malay. Booa-sow.

Achras *dissecta. Linn. Supp.* 210. *Forst. pl. escul. N.* 13.

A native of the Malay Islands, Malabar, &c. It flowers during the hot season; the fruit is edible, and large.

3. M. *hexandra. Willd.* 2. 326. *R. Corom. pl.* 1. *N.* 15.

Leaves alternate, long-petioled, obovate, emarginate, smooth. *Flowers* hexandrous.

Tamul. Pallæ.

Teling. Palla.

This tree is a native of the mountainous parts of the Circars; it is never cultivated, nor have I seen it near cultivated places. It flowers during the hot, and beginning of the wet season.

Trunk erect, frequently when old it has large rotten excavations. *Bark* ash-coloured. *Branches* numerous, rigid, spreading, extremities nearly erect, forming a large shady head. *Leaves* alternate, petioled, broad, wedge-formed, or obcordate, deeply emarginate, very hard,
II. both sides of a deep shining green; from three to five inches long, and one and a half, or two
239 broad. *Petioles* round, one, or one and a half inch long. *Peduncles* axillary, from one to six, erect or spreading, nearly as long as the petioles, clubbed, undivided, one-flowered. *Flowers* considerably smaller than the former. *Calyx* inferior, six-leaved, three interior and three exterior; these last mentioned three are leathery. *Corol* one-petalled. *Tube* very short. *Border* like *Elengi*, consisting of two rows of segments, the exterior twelve, the interior six, all spread-

ing. *Nectary* situated between the filaments, as in the former, but spreading, shorter and more deeply indented. *Filament* six, spreading. *Anthers* oval. *Pistillum* as in *Elengi*, but six-celled. *Berry* the size and shape of an olive, yellow, rarely more than one-seeded. *Perisperm, embryo*, &c. as in *Elengi*. Page Carey Ed.

CYMINOSMA. Gært.

Calyx four-leaved. *Corol* four-petalled. *Berry* superior, four-celled. *Seed* solitary. *Embryo* inverse, and furnished with a perisperm.

C. *pedunculata. R.*

Jambolifera *pedunculata. Willd.* 2. 326. *Vahl. Symb.* 3. 52. *t.* 61. *good.*

Cyminosma, baccæ ovato acuminatæ. *Gært. sem.* 1. *p.* 281. *t.* 58. *f.* 1.

Perin-panel. *Rheed. Mal.* 5. *t.* 15.

Dr. Konig's description of this plant as given by Dr. Dryander, in the 2nd. vol. of the Transactions of the Linnæan Society; page 233 is very correct.

A native of Ceylon, Chittagong, &c.

XYLOCARPUS Schreb. gen. n. 646.

Calyx four-toothed. *Corol* four-petalled. *Nectary* eight-cleft, staminiferous. *Capsule* four-valved, cells uncertain, replete with from six to twelve, angular, variously shaped seeds. *Embryo* centrifugal. II. 240

X. *granatum. Willd.* 2. 328.

Leaflets opposite, from two to three pair, oblong, smooth.

Granatum litoreum. *Rumph. Amb. vol.* 3. *t.* 61.

Tam. Kandalanga.

Cing. Kadul-gaha.

Beng. Pussoor.

This tree is a native of the Soonderbuns, (the lower Delta of the Ganges.) Fruit ripens in June and July.

Leaves alternate about the extremities of the branchlets, pinnate; from six to twelve inches long. *Leaflets* two pair, opposite, sessile, oblong, entire, obtuse, smooth, deep on both sides; about four inches long. *Petioles* round, smooth, dark brown. *Stipules* none.

GUAREA. Schreb. gen. n. 649.

Calyx four-toothed. *Petals* four. *Nectary* cylindric, bearing the anthers in its mouth. *Germ* superior, four-celled, cells two-seeded; attachment superior. *Capsule* four-celled, four-valved. *Seed* solitary. *Embryo* inverse; no perisperm.

1. G. *binertarifera. R.*

Arboreous. *Leaves* pinnate; *leaflets* from four to six pair, alternate. *Panicles* rigid, axillary, composed of dichotomous ramifications. *Nectary* double.

A native of the eastern parts of Bengal, where it grows to be a tree of considerable size. Flowering time the beginning of the rains, in June. Seed ripens in February.

Trunk straight. *Bark* smooth, between ash colour, and olive. *Branches* patent; *young shoots* round, and pretty smooth. *Leaves* alternate, pinnate, from one to seven on each side, drooping, ovate-oblong, petioled, from one to two feet long; leaflets alternate, petioletted, taper-pointed, entire, smooth on both sides, about six inches long, and two or three broad. II. 241 *Petioles* common, flat on the upper side below the leaflets, where they are inserted, flexuose, and nearly round. *Petiolets* short, and round. *Stipules* none. *Panicles* axillary, or rather above the axils, rigid, not half the length of the leaves, composed of short, alternate, rigid, expanding ramifications. In old stunted trees, the panicle has dwindled into a small, rigid, simple raceme. *Bractes* minute, caducous at a very early period. *Flowers* rather small, of a pale yellow colour, inodorous. *Calyx* one-leaved, small, campanulate; mouth four-toothed. *Petals* four, linear, recurvate, many times larger than the calyx, and rather longer than the exterior nectary. *Nectary* double; *exterior* subcylindric, and of a deeper yellow colour than the petals; mouth a little contracted, and obscurely eight-toothed, the inner one somewhat gibbous, about one-third of the length of the exterior one, fleshy, orange-coloured; *mouth* funnel-shaped, eight-toothed; *teeth* alternately smaller, and many of them dentate. *Filament* none. *Anthers* eight, inserted on the inside of the exterior nectary, a little within its mouth, and immediately under the eight fissures. *Germ* superior, ovate, four-celled, with two horizontally placed *ovula* in each, attached to the top of the axis. *Style* cylindric as long as the exterior nectary. *Stigma* enlarged; apex obscurely four-lobed, its base surrounded with a belt. *Capsule* globose, the size of an apple, of a hard fleshy texture, smooth; when ripe, of a deep yellow throughout, four-celled, four-valved, opening from the apex. *Seed* solitary, obovate, oblong, the size and appearance of a chesnut; no *aril*. *Integument* single, spongy; the outside polished, of a dark purple colour; inwardly yellow. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed, firm, of a deep green round the edges, paler within. *Plumula* conic, two-lobed. *Radicle* ovate, superior, its apex considerably within the vertex of the cotyledons. II. 242

Of all I have yet examined, this tree comes nearest to *Sandoricum Indicum*. I have not observed that any part of it possesses any peculiar odour, which, with the double nectary is a sufficient reason to induce me to think it is not the American species, *Guarea trichiloides*.

Page Carey Ed.

2. G. *paniculata. R.*

Leaves alternate, abruptly pinnate; *leaflets* from six to twelve pair, alternate and opposite, ovate-lanceolate. *Panicles* axillary.

Kulikoura is the vernacular name in Silhet, where it grows to be a pretty large tree. Flowering time May and June; the seed ripens the following April.

Young shoots slightly villous. *Leaves* alternate, abruptly pinnate, from eighteen to thirty inches long. *Leaflets* from six to fourteen pair, short-petiolate, the inferior pairs often alternate, those above opposite, somewhat unequally ovate, lanceolate, entire, taper-pointed, nearly smooth; from five to ten inches long, and two or four broad. *Common petioles* round and villous. *Stipules* none. *Panicles* axillary, solitary, nearly as long as the leaves, spreading. *Ramifications* villous. *Flowers* very numerous, pedicelled, pretty large, of a pale yellow, expanding in the evening, and dropping the next morning. *Bractes* filiform, villous. *Calyx* cup-shaped, obscurely four-toothed, a little villous. *Petals* four, spatulate, obtuse, recurved. *Nectary* cylindric, the length of the corol, and hairy on both sides; the mouth eight-toothed; *segments* bidentate. *Filaments* scarcely any. *Anthers* oblong, attached round the inside of the mouth of the nectary. *Germ* superior, ovate four-celled, with one, rarely two *ovula* in each, attached to the top of the axis. *Style* the length of the nectary, hairy. *Stigma* globular. *Capsule* globular, the size of a crab apple, three or four-lobed, with a furrow between, smooth, of a dark orange colour, from three to four-celled, from three to four-
II. valved; *valves* thick, and spongy, with the partitions rising down the middle. *Seed* solitary,
243 round or oval, considerably flattened; *interior* half yellow, in the middle of which is a large whitish, flat umbilicus; *exterior* half of a smooth, shining, chesnut colour, across which is a trifling groove, marking the separation of the transverse cotyledons. *Perisperm* none. *Embryo* transverse. *Cotyledons* conform to the seed. The *Plumula* and *Radicle* together form a minute, round spot in the centre of the cotyledons, the former pointing to the umbilicus, and the latter to the circumference, (*centrifugal.*)

MOLINÆA. Juss.

Calyx five-parted. *Corol* five-petalled, unequal. *Filaments* woolly, ascending over the small petal. *Capsule* three-celled, three-valved. *Seed* solitary.

1. M. *canescens. Willd.* 2. 329. *Corom. pl.* 1. *N.* 60.

Leaves abruptly-pinnate; *leaflets* two pair, obtuse. *Racemes* on the leafless branchlets. *Style* single; *stigma* three-toothed.

Teling. Korivee.

Sapindus *tetraphyllus. Vahl. Symb.* 3. 54.

A native of the Circar mountains, and flowers about the time the Sapindus does.

Trunk not straight, but thick. *Bark* ash-coloured, a little scabrous. *Branches* numerous, spreading in every direction. *Leaves* alternate, abruptly-pinnate, sometimes ternate, about six or eight inches long. *Leaflets* opposite, generally two-pair, oblong, entire, smooth, shining, firm, five or six inches long, and two or three broad. *Petioles* round, four or five inches long. *Racemes* many, simple, or compound, from the extremities of the last, or two last
II. years' leafless branchlets round the base of the present year's shoots. *Flowers* small, white,
244 fascicled. *Calyx* inferior, five-parted. *Petals* five, four large, and standing on the upper side, the fifth small, standing singly on the under side. *Nectary* the leaflets torn, and woolly. *Style* single. *Stigma* three-toothed. *Capsule* single, three-sided, three-celled, three-valved. *Seeds* one in each cell.

The wood of this tree is white and not so serviceable as that of *Sapindus rubiginosus.*

2. M. *lævis. Willd.* 2. 329.

Leaves abruptly-pinnate; *leaflets* one or two pairs, cuneate-obovate, obtuse, entire, smooth *Panicles* axillary. *Petals* round, with a woolly scale in each side near the base.

A handsome slender tree, a native of the Mauritius, where it blossoms in June and July, and the seeds ripen in October.

AMYRIS. Schreb. gen. n. 650.

Calyx four-toothed. *Corol* of four expanding *petals. Germ* superior, four-celled; *cells* from two to three-seeded; attachment interior. *Berry* one-seeded. *Embryo* inverse, without perisperm.

1. A. *simplicifolia. R.*

Leaves simple, oblong, and broad lanceolate. *Racemes* axillary, short, few-flowered. *Germ* two-celled.

A small tree, a native of Pulo Pinang. In this species, the leaf is joined to the apex of the petiole by an articulation, and there the leaf falls off, leaving the petiole, which is much more permanent.

The racemes are about twice the length of the petioles; the flower small and white. The ripe fruit has not been found.

II. 2. A. *commiphora. R.*

245 Arboreous, branchlets often ending in spines. *Leaves* petioled, simple, elliptic, serrate, acute, with a pair of minute leaflets, or ears at the base. *Flowers* axillary.

Commiphora *Madagascarensis. Jacq. Schoenbr.* 2. *p.* 66. *t.* 249.

Sans. and *Beng. Googgula.*

The tree is a native of Silhet, Assam, &c. E. and N. E. from Bengal, in the Botanic Garden at Calcutta it blossoms about the beginning of the hot season, in February and March, but seldom ripens its seed.

Trunk of our small trees crooked, and clothed with many spreading and drooping, crooked *branches* down to the ground. The short lateral *branchlets* often end in thorny points. *Bark* of the young shoots green and smooth, that of the larger *branches*, and *trunk* covered with a light coloured pellicle as in the common *birch*, which peels off from time to time, exposing to view a smooth green coat, which in succession supplies other similar exfoliations. *Leaves* alternate, petioled, oval, or elliptic, serrulate, smooth on both sides, at the base or apex of the *petiole* on each side, is generally found a small leaflet tending to give the whole the appearance of a ternate leaf. *Flowers* short-pedicelled, small, red, collected in little bundles on the small protuberant gems left by the former years' leaves, over the now leafless slender twigs. *Calyx, corol,* and *stamina* as in the genus. *Nectary,* eight glands alternate with the insertion of the filaments. *Berry* drupaceous, the size of a black currant, red, smooth. *Nut* two-celled, with a single seed in each. Page Carey Ei.

The whole plant, while growing is considerably odoriferous, particularly when any part is broken or bruised, and diffuses a grateful fragrance, like that of the finest *myrrh,* to a considerable distance round, which for some time induced me to think it might be the plant from which that drug was procured, particularly as I observed on being wounded, there exuded much pale coloured juice, but unfortunately for my conjecture, it is soon carried off by evaporation, leaving little or nothing behind. I have at various times of the year wounded the plant in different places, and placed various contrivances to collect the juice, but all I could ever procure, was a very minute portion of a gummy matter, which certainly resembled *myrrh* both in smell and appearance, but had no tendancy to be tenacious, or elastic, hence I conclude there must be a mistake in its being the elastic gum tree of Madagascar, as mentioned by Jacquin. II. 246

3. A. *gileadensis. Willd.* 2. 334.

Shrubby, the branches and branchlets spinous. *Leaves* short-petioled, ternate; *leaflets* from oval to elliptic, serrulate, smooth.

A native of Arabia. It has not yet blossomed in the Botanic garden at Calcutta, though a pretty large plant has been there five years.

4. A. *acuminata. R.*

Arboreous. *Leaves* ternate, and quinate, rarely of seven leaflets, pinnate; *leaflets* petioled, from ovate to oval, entire, acuminate, smooth. *Peduncles* diverging, three-flowered, or trichotomous, and many-flowered. *Stamens* shorter than the pistillum.

Introduced into the Botanic garden at Calcutta from the Moluccas, in 1798. In 1808 the young trees had acquired a short trunk, of eighteen inches in circumference, and not very straight, covered with very smooth greenish ash-coloured, fleshy bark.

Branches stiff but brittle and spreading in every directions; bark thereof like that of the trunk. In Bengal they blossom in May, but have not yet produced ripe fruit. *Leaves* alternate, ternate, and quinate-pinnate, rarely seven, and nine still more so; in Bengal deciduous in November and December, and appearing with the flowers in May. *Leaflets* petioled, oval, or ovate, taper-pointed, entire, polished; about three inches long and about two broad. *Petioles* nearly as long as the leaflets, round, polished, and coloured. *Stipules* none. *Peduncles* axillary and from the base of the tender shoots below the young leaves, as well as from the apices of small lateral, leaflets scions; often as long as the petioles, diverging, three-flowered, or once, or twice dichotomous, and many-flowered. *Flowers* small, yellow. In Bengal they have hitherto proved abortive. *Bractes* in opposite pairs, at the divisions of the peduncles, lanceolate, smooth and fleshy. *Calyx* four-toothed, half the length of the petals. *Petals* four, linear-oblong, their lower two-thirds forming a tube, the upper third expanding, and acute. *Filaments* eight, shorter than the germ, alternately longer, inserted on a fleshy ring round the base of the germ. *Anthers* ovate-sagittate, apparently destitute of pollen. *Germ* ovate-oblong, clammy, two-celled, with two *ovula* in each, attached to the partition below the middle. *Style* scarcely any. *Stigma* large two-lobed, and these again somewhat two-lobed. *Fruit* not seen. II. 247

The *Bark* and all the tender parts of the plants, on being bruised or wounded, discharges a small quantity of a pale whey-coloured liquid, which possesses a fragrance something like that of the orange leaf.

In Bengal the flowers constantly prove abortive. I therefore conclude the tree to be polygamous, and that ours are all female-hermaphrodites, with imperfect stamina.

When the trees were younger, the leaflets were more numerous, often five and sometimes seven; I then thought it might be *Amyris Protium,* but have now reason to think it a new species.

5. A. *pentaphylla. R.* II. 248

Shrubby. *Leaves* pinnate-quinate; *leaflets* broad-lanceolar, entire. *Panicle* terminal. *Berry* ovate, verrucose.

Plants of this species were presented to the garden at Calcutta, by Colonel Hardwicke, who found them indigenous in the vicinity of Cawnpore. In this garden they blossomed in March, when about four years old, and not more than three feet high, with a simple slender stem, covered with smooth, ash-coloured bark.

Leaves alternate, unequally pinnate, from six to twelve inches long. *Leaflets* generally five, often subalternate, short-petiolleted, entire, broad-lanceolar; from two to six inches long. When bruised between the fingers, very fragrant. *Stipules* none. *Panicles* terminal, erect, compased of short, expanding, two or three times dichotomous branches, with always a single short pedicelled flower in the fork, which makes them appear trichotomous. *Bractes* minute. *Calyx* small, four-toothed. *Petals* oblong, concave, dotted with glands on the outside, much larger than the calyx. *Filaments* broad. *Anthers* ovate. *Germ* ovate, hairy, four-celled, with

Page Carey Ed. many *ovula* in each, elevated on a short receptacle, into the under part of which the filaments are inserted. *Style* very short. *Stigma* four-toothed. *Berry* ovate, pulpy, of a pale orange colour, verrucose; the size of a small cherry, lengthened to an obtuse point. *Seed* single, oval, smooth.

6. A. *heptaphylla. R.*

Shrubby. *Leaves* alternate, pinnate; *leaflets* alternate, from three to four pair, entire. *Panicles* terminal. *Berries* sub-cylindric.

Karunphul is the name it is known by about Calcutta, which is the only place in which I have yet found it.

Trunk, in all the plants I have seen, there is scarcely any, but many, suberect *branches*, II. covered with dark coloured, smooth bark; general height from five to six feet. *Leaves* alter- 249 nate, pinnate; from six to twelve inches long. *Leaflets* alternate; short-petiolleted; from three to four pair, obliquely oblong-lanceolate, entire, marked through and through with transparent dots, those towards the base of the common petiole smallest. *Panicles* terminal, composed of diverging, trichotomous ramifications. *Flowers* numerous, small, whitish yellow. *Calyx, corol, receptacles, stamens* and *pistil* as in the family. *Berry* oblong, covered with glandular dots; when ripe pale yellow. *Seed* solitary.

The leaves, when bruised, give out in a very strong degree the fragrance of the finest and freshest anise.

7. A. *nana. R.*

Shrubby. *Leaflets* from five to eleven, opposite, and alternate, ovate, crenulate, smooth. *Panicles* axillary. *Berries* round.

Introduced from the Moluccas, into the Botanic garden at Calcutta, where it blossoms in April and May. Seed ripe in June and July.

Trunk erect, in our young plants, simple. *Bark* smooth, dark brown, whole height of four years' old plants from two to five feet. *Leaves* alternate, pinnate, with an odd one. *Leaflets* from five to eleven, subopposite, or alternate, short-petioled, obliquely ovate, more or less crenulate, emarginate, smooth on both sides; general length from one to two inches. *Petioles*, and *petiolets* round, and somewhat glandular. *Racemes* simple, and compound, axillary, solitary; the simple shorter than the leaves, the compound, or panicles, they may be called, about as long as the leaves. *Flowers* minute, whitish, alternate, rather remote. *Calyx* four-toothed, glandular. *Petals* oblong, concave, marked with green glands on the back. *Filaments* short, with a broad concave base, converging over the germ. *Anthers* erect, oblong. *Germ* II. elevated on a short receptacle, four-lobed, glandular. *Style* short. *Stigma* four-lobed. *Berry* 250 nearly round, size of a large pea, pale greenish somewhat pellucid white.

Note. This description is taken from a small plant of two years' growth when it first blossomed, but I find they grow to be large, elegant, very fragrant shrubs.

8. A. *suffruticosa. R.*

Suffruticose; *leaflets* about eleven or thirteen, opposite, or alternate, short-petioled, ovate. *Panicles* axillary. *Berry* linear, oblong.

A native of Chittagong, and from thence sent by Dr. Buchanan to the Botanic garden at Calcutta, where it blossoms in the months of February and March. Seed ripe in April and May.

Stem simple, about two feet high. *Bark* of the lower woody part ash-coloured, of the young shoots green and villous. *Leaves* alternate, pinnate, expanding from six to sixteen inches in length. *Leaflets* generally from eleven to fifteen, opposite, and alternate, short-petiolleted, the lower pairs small, cordate-ovate, the superior oblong; all are entire, and downy on both sides. *Petioles*, and *petiolets* round and downy. *Panicles* axillary, diverging, scarcely half the length of the leaves, villous. *Flowers* numerous, small, greenish white.

Calyx small, with four acute divisions. *Petals* four, expanding, concave. *Nectary* a small fleshy ring round the base of the germ. *Filaments* alternately a little shorter, enlarged at the base. *Anthers* large, two-lobed. *Germ* globular. *Style* the length of the stamens. *Stigma* small, four-lobed. *Berries* lanceolate, drooping, orange-coloured, succulent, marked with numerous, large, pellucid glands, nearly an inch long, and about a quarter of an inch in diameter. *Seed* solitary, shaped like the berry, green.

II. 9. A. *sumatrana. R.*

251 Arboreous, tender parts villous. *Leaflets* from eight to twelve pairs, opposite or alternate, unequally ovate-lanceolate, entire. *Panicles* terminal. *Berries* oval.

From Sumatra this tree has been introduced into the Botanic garden at Calcutta, where in five years the plants grew to the height of twenty feet, with a long, perfectly straight trunk, covered with smooth brownish olive-coloured back. The leaves when fresh and bruised emit a pleasant aromatic odour like that of the lemon leaf. The *filaments* spread out at the base, as in A. *punctata;* the *receptacle* of the germ is also the same, but the *style* and *stigma* are here entire. Flowers and ripens its seed at various periods in Bengal.

9. A. *punctata. R.*

Arboreous; *leaflets* from twelve to fifteen pair, ovate-lanceolate, crenalate, dotted. *Panicles* terminal. *Germs* elevated on a receptacle. *Berries* round, glandular.

I have only met with this tree in the Company's Botanic garden at Calcutta, to which it was brought from Chittagong some years ago. The Chinese gardeners say it grows in China also. The trees seem full grown, and are about twelve feet high, rather thin of branches, with the lower-most spreading near the surface of the earth. *Bark* smooth, dark rust-coloured. Leaves entirely deciduous during the cold season, they appear again with the flowers in March.

Leaves alternate, pinnate, with an odd one, from twelve to eighteen inches long. *Leaflets*

alternate, short-petiolleted, from ten to twenty pairs, obliquely-oblong, the lower half being lanceolate, and the upper falcate. *Margins* crenulate; both sides of a dull green, and marked with glandular dots; size various, those about the middle are the largest, being generally from three to four inches long and about one broad. *Stipules* none. *Petioles* and *petiolets* round, a little scabrous, and somewhat hairy. *Panicles* terminal, oval, erect; the peduncles and subdivisions a little hairy. *Bractes* minute. *Flowers* numerous, small, white. *Calyx* small, four-toothed. *Petals* four, oval, spreading, concave, inserted by claws, nectary a large fleshy receptacle, contracted at the middle, the lower swelling receiving the petals, and filaments, the upper supporting the germ. *Filaments* eight, below very much enlarged, with their insides concave to receive the corresponding convexity of the germ and nectary; they are shorter than the corol. *Anthers* oval. *Germ* four-sided. *Style* thick, four-sided, straight, the length of the stamens. *Stigma* truncated, obsoletely four-pointed. *Berry* as in the genus. Page Carey Ed. II. 252

The leaves when bruised smell like sassafras.

XIMENIA.

Calyx four-toothed. *Corol* four-petalled, hairy on the inside, and revolute, forming a bell. *Drupe* superior; one-seeded.

1. X. *americana. Willd.* 2. 330.

Shrubby, armed. *Leaves* alternate, oval, emarginate. *Peduncles* many-flowered.

Teling. Oora-nechra.

A large, ramous, thorny shrub, a native of forests, and mountains. It flowers about the beginning of the hot season. *Trunk* and *branches* irregularly disposed. *Bark* scabrous, inwardly red, and very astringent. *Thorns* axillary, or terminating the branchlets, single, large, bearing leaves, flowers, and sometimes smaller thorns. *Leaves* alternate, short-petioled, oval, emarginate, smooth, about two inches long, and one broad. *Racemes* axillary, or from the extremities of small branchlets, one, two, or three together, small, erect, each bearing, generally, from four to six flowers. *Peduncles* and *pedicels* round, smooth. *Bractes* small, single. *Flowers* of a dull white, small, many of them male. *Calyx* below, small, generally four-toothed, though sometimes five-toothed. *Petals* four or five, corresponding with the number of toothlets in the calyx, oblong, campanulate, with the upper half revolute, very hairy on the inside. *Filaments* from eight to ten, erect, short. *Anthers* linear, erect. *Germ* superior, conical. *Style* tapering, the length of the filaments. *Stigma* simple. *Drupe* oval, size of a nutmeg, pulpy, red, smooth, one-celled. *Nut* solitary, of the same shape as the drupe, not very hard. The ripe fruits are eaten raw by the natives; their taste is a compound of sour and bitter. The kernels are also eaten, and taste much like fresh filberts. The wood is yellow, like sandal, and its powder is often substituted for that of sandal by the brahmuns on this part of the coast in their religious ceremonies. II. 253

2. X. *ægyptiaca. Jussieu. genera. p.* 288.

Thorny. *Leaves* binate. *Flowers* decandrous. *Drupe* torose.

Hind. Hingen.

Teling. Garee.

In the *Memoirs sur L'Egypt*, is a paper on this plant, by M. A. Dehile, where he says the fruit passes in Egypt for *Chebulic myrobalans.*

This seems to me a new genus rather than a species of *Ximenia.* It is an hostile-looking, small tree, or large shrub, grows on the most inhospitable, dry, barren, uncultivated places in the Circars. Flowering in May.

Trunk erect; *bark* ash-coloured, crooked. *Branches* few, erect, with extremities spreading, and often drooping. *Thorns* axillary, single, large, strong, very sharp, frequently leaf and flower-bearing. *Leaves* scattered, petioled, binate. *Leaflets* short-petiolated, from oval to oblong, smooth, shining, when young downy; about an inch and a half long, and three quarters broad. *Peduncles* axillary, short, downy, many flowered. *Flowers* small, greenish-white, pedicelled. *Calyx* inferior, five-leaved; *leaflets* oval, downy, spreading. *Petals* five, very like the calyx. *Nectary* a large, fleshy green, ten-notched, ten-grooved ring, surrounding the lower half of the germ. *Filaments* ten, rather shorter than the petals, inserted between the nectary and petals. *Anthers* cordate. *Germ* superior, woolly, five-grooved, five-celled, with one *ovula* in each, attached to the upper end of the axis. *Style* erect, short. *Stigma* slightly five-lobed. *Drupe* size of a pullet's egg, five-grooved, covered with a smooth, light grey, dry cortex. Pulp very like soft soap, exceedingly bitter, having an offensive greasy smell. *Nut* exceedingly hard, one-celled, one-seeded. II. 254

The nut is employed in fire works. A small hole is drilled in it, at which the kernel is extracted, and being filled with powder, and fired, bursts with a very loud report, so exceedingly hard is the nut; I know no other use to which any part of this shrub is put.

PIERARDIA. R.

Calyx four-leaved. *Corol* none. *Germ* superior, four-celled; cells two-seeded, attachment superior. *Style* scarcely any. *Stigma* tetragonal. *Berry* with three or four arilled seeds. *Embryo* inverse, and furnished with a perisperm.

P. *sapida. R.*

Lutco of the Hindoos, about Tippera, &c. to the eastward of Calcutta, where the tree is indigenous.

A few small trees are now in the Company's Botanic garden at Calcutta; they were ori-

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ginally from Tippera. Our Chinese gardeners say it is also a native of their country, where it is called Lutqua, and its cultivated for its agreeable fruit, our trees are as yet small, from six to ten feet high, with little or no trunk, but many, sub-erect branches, covered with dark-coloured, scabrous bark. In their native soil they blossom in February, and ripen their fruit in June.

Leaves alternate, petioled, oblong, entire, smooth on both sides; generally about eight inches long. *Petioles* channelled, about two inches long. *Racemes* from the naked branches (such as are about the thickness of the little finger seem to produce the greatest number) drooping, covered nearly to the base with numerous, small, yellow flowers. *Bractes* lanceolate, inserted on the common peduncle, three-flowered, each flower hanging on its proper pedicel, there uniting into a common one rather shorter than its bracte. *Calyx*, or corol, for there is but one, four-leaved; *leaflets* oval, downy, fleshy, incurved over the stamens, and pistil. *Filaments* generally eight, short, incurved, inserted round the base of the germ. *Anthers* two-lobed. *Germ* superior, round, three or more generally four-celled, with two *ovula* in each, attached to the top of the cell. *Berry* round, size of a large gooseberry, smooth, yellow, from three to four-celled. *Seed* solitary, subovate; invested in a copious soft, white, subacid, edible aril. *Integument* reddish, firm, pretty thick. *Perisperm* conform to the seed, cartilaginous. *Embryo* nearly as broad and long as the perisperm, inverse. *Cotyledons* oval, three-nerved. *Radicle* oval, superior.

Note. This new genus, for so it seems to me, I have named after Francis Pierard, Esq. one of the Honourable East India Company's Civil Servants. His abilities as a Botanist, in discovering various new plants, with which he has enriched the Honourable Company's Botanic garden, claims for him this mark of distinction.

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DODONŒA.

Calyx or *corol* four-leaved. *Capsule* three-celled, three-valved, three-winged. *Seeds* one or two in each cell.

1. D. *angustifolia. Willd.* 2. 344.

Polygamous, shrubby. *Leaves* linear-lanceolate. *Racemes* axillary and terminal.

A large ramous, erect shrub, very common on the barren uncultivated lands of Coromandel. It flowers during the rains.

Leaves scattered, sub-sessile, linear-lanceolate, smooth, entire, margins a little revolute; from two to four inches long; on the gems and young leaves a little bright yellow resin is generally found. *Racemes* axillary, and terminal, generally terminal, much shorter than the leaves, few flowered. *Flowers* long-pedicelled, small, of a greenish colour.

HERMAPHRODITE FLOWERS have sometimes a fifth more parts than in the genus, there is only one seed in each cell of the capsule, and sometimes the capsule consists of only two cells, and two wings.

FEMALE FLOWERS, are sometimes mixed with the hermaphrodite, and sometimes occupy a distinct plant; they want the stamens entirely, otherwise they agree.

2. D. *dioeca. R.*

Dioecous, shrubby. *Leaves* lanceolate. *Racemes* axillary and terminal.

A native of the interior parts of India. Flowering time the rainy season.

Stem erect, woody, with numerous, suberect, woody branches. *Bark* smooth, light brown. *Leaves* alternate, short-petioled, broad-lanceolate, tapering most towards the base, entire, smooth. *Racemes* axillary, and terminal, solitary, short, corymbiform. *Flowers* with long slender, nodding pedicels. *Bractes* minute. MALE. *Calyx* four-leaved. *Corol* none. *Filaments* seven or eight, very short. *Anther* linear, six or eight times longer than the filaments.

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FEMALE FLOWERS on a separate tree. *Calyx* as in the male. *Corol* none. *Germ* superior, three-lobed. *Style* long, three-sided, as if composed of three portions. *Stigma* three-pointed. The ripe seed vessel has not been found.

MELICOPE.

Calyx four-parted. *Corol* four-petalled. *Nectary* surrounding the germ. *Capsules* superior, four, singly ovate-oblong, two-valved, one-celled, with a single winged *seed* in each.

M. *tetrandra. R.*

Arboreous. *Leaves* opposite, obovate. *Corymbs* axillary. *Flowers* tetrandrous.

This tree is a native of Pulo Pinang where it blossoms in May.

Branchlets round, and smooth. *Leaves* near the extremities of the branchlets, opposite, petioled, cuneate, obovate, entire, smooth on both sides; from three to four inches long, and two or two and a half broad. *Petioles* scarcely an inch long, channelled, smooth, swelled at the apex, as if united to the leaf by an articulation. *Stipules* not visible. *Corymbs* axillary, opposite, long-peduncled, supra-decompound, smaller ramifications villous. *Bractes* minute, solitary under each division and sub-division. *Flowers* pedicelled, small, very numerous. *Calyx* four-cleft, small, permanent. *Petals* four, cordate, acute, expanding, inserted between the calyx and nectary; on the disk of each rests a small, seemingly abortive stamen. *Nectary* a fleshy ring round the four-lobed germ. *Filaments* four, expanding, alternate with the petals, and of the same length, inserted on the four angles of the nectary. *Anthers* cordate. *Germ* superior, immersed in the nectary, four-lobed. *Style* single. *Stigma* most slightly four-lobed. *Capsule* deeply two-lobed, each lobe oblong, one-celled, two-valved, but not opening readily. *Seeds* one or two in each lobe, or cell of the pericarp, inserted at the base, and all but the apex envelop-

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ed in an orange coloured, fleshy aril.

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LAWSONIA.

Calyx four-toothed. *Corol* four-petalled, inserted into the bottom of the calyx alternately with the pairs of stamens. *Germ* four-celled, cells many-seeded; attachment central. *Capsule* superior, four-celled, many-seeded. *Embryo* with centripetal radicle, and no perisperm.

L. *inermis. Willd.* 2. 344.

Arboreous, armed, in a bad soil. *Leaves* ventricose-lanceolate.

Alcanua. *Gært. sem.* 2. 133. *t.* 110.

Mail-anschi. *Rheed. Mal.* 1. *t.* 40.

Beng. Mendee.

Pers. Henna.

Arab. Erkan.

Teling. Gounta.

On the coast of Coromandel where it is indigenous, I have commonly found it in the state of a large shrub, though it is naturally a small, ramous tree. Here it is in flower and seed most part of the year.

Trunk crooked, of various lengths and thickness. *Bark* rust-coloured. *Branches* very numerous, standing in every direction; *young shoots* somewhat angular. *Leaves* opposite, short-petioled oblong, or broad lanceolate, pointed at both ends; about an inch long, and less than half an inch broad. *Stipules* wanting. *Panicles* terminal, globular, cross-armed, many flowered. *Bractes* scarcely any. *Flowers* small, greenish-yellow, very fragrant. *Petals* orbicular, inserted into the divisions of the calyx; *margins* involute, and very much curled, as in *Lagerstræmia. Filaments* longer than the corol, inserted by pairs into the calyx between the petals. *Germ* superior, four-celled; *ovula* numerous, attached to the axis. *Style* the length of the stamens, somewhat bent. *Stigma* simple. *Capsule* globular, the size of a grain of pepper, four-grooved, with the apex depressed, having in it part of the remaining style, four-celled; *partitions* membranaceous. *Seeds* angular, wedge-form, inserted by their apices round the middle, or enlarged part of a centrical, columnar receptacle. *Embryo* with centripetal radicle, and no perisperm. II. 259

It is much used for hedges, growing readily from cuttings; consequently fertile seeds are not often met with. The flowers are remarkably fragrant, whether fresh or dry, and are particularly grateful at a distance.

The species called *spinosa* is nothing more, I imagine, than the same plant growing on a dry sterile soil; at least, in such soils, I have often found it very thorny, the branchlets being then short and rigid, with sharp thorny points.

The fresh leaves beat up with *Catechu*, dyes the nails and skin of a reddish orange colour, which is much admired by the fair sex all over India. The fresh made paste is laid on at bed time, and removed in the morning; the colour remains till the nails or epedermis is renewed, or removed.

The leaves yield in decoction a porter coloured liquor; I have found it a deep orange colour, which acids destroy, while alkalies and infusions of astringent vegetables deepen it; this decoction dyes the finger of a deep orange; but does not communicate any colour to cloth variously prepared, nor could I procure any precipitate from the decoction worth attending to.

MEMECYLON.

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Calyx four-toothed. *Corols* four-petalled. *Nectary* four glands, inserted just over the stamina, in the fissure of the calyx. *Berry* inferior, one-seeded.

1. M. *edule. R. Corom. pl.* 1. *N.* 82.

Shrubby. *Leaves* opposite, oval, smooth. *Umbellets* from the naked branches, and stems below the leaves.

Comus *sylvestris. Burm. Zeyl. p.* 76. *t.* 31.

Teling. Alie.

The leaves are an ingredient in the dyes of Coromandel. I therefore suspect *M. tinctorium* of Willdenow may be the same plant.

A very common, small tree, or large shrub; it is to be found in every jungle all over the coast. It flowers about the beginning of the hot season.

Trunk very irregular in shape and size, covered with a dark coloured, scabrous bark. *Branches* numerous, nearly erect. *Leaves* opposite, short-petioled, oval, smooth, shining, firm, entire, with scarcely any veins, from three to four inches long, and from two to three broad. *Umbellets* many, compound, small, from scabrous elevations, where the leaves stood, over the old woody branches. *Peduncles* common, and partial, four-sided. *Pedicels* round, coloured. The generic character as in Richard's edition of the Genera Plantarum. *Seeds*, seldom more than one comes to perfection, though in the germ the rudiments of many are to be seen.

The ripe berries are eaten by the natives; they are astringent; the pulp is of a bluish black colour, and is found in considerable quantity.

2. M. *amplexicaulis. R.*

Leaves opposite, half stem-clasping, ovate-cordate. Flowers in sessile, axillary heads. II. 261

A native of Pulo Pinang.

Leaves opposite, sessile, half stem-clasping, ovate cordate, smooth, shining, entire, of a firm texture, and veinless; from four to six inches long. *Flowers* numerous, very small, collected in round, sessile heads, in the axills of the leaves, or below them. *Bractes* two at the

Page Carey Ed. base of each pedicel. *Calyx* four-toothed. *Petals* orbicular, sessile. *Stamens*, length of the petals. *Berries* about the size of a gooseberry, dry. *Seed* solitary, round.

MARLEA. R.

Calyx from six to eight toothed, superior. *Petals* from six to eight, *Germ* inferior, two-celled ; cells one-seeded ; attachment superior. *Drupe* with a two-celled nut. *Embryo* inverse, furnished with a perisperm.

M. *begonifolia. R.*

Marlea is the vernacular name in Silhet, where it is indigenous and grows to the size of a small tree, yielding timber which is employed by the natives in the construction of their houses. Flowering time the month of April ; the seed ripens in July.

In its natural character it approaches near to *Alangium ;* the number of stamina, and the internal structure of the germ and drupe, however, are so different, as to induce me to consider it sufficiently distinct to form a separate genus, which I do under its vernacular name of Marlea.

Leaves alternate, petioled, unequally cordate, as in *Begonia*, entire, or lobate, acuminate, smooth, five, or more-nerved ; from four to eight inches long, by from three to five broad. *Petioles* round, a little villous, about an inch long. *Stipules* none. *Pedyncles* axillary, the length
II of the petioles, dichotomous, many-flowered. *Flowers* of a middling size, short-pedicelled, pe-
262 tals white. *Calyx* superior, small, from six to eight-toothed. *Petals* from six to eight, linear, recurved. *Filaments* eight, short, flat, hairy, inserted within the petals on a glandular hemispherical body which crowns the germ. *Anthers* linear, very long. *Germ* inferior, two-celled, with one *ovula* in each, attached to the top of the axis. *Style* the length of the stamina. *Stigma* large, four-toothed. *Drupe* oval, obtuse-pointed, the size of a small cherry, pulp in small quantity but soft and dark coloured ; round the base of the obtuse point may be traced the minute remains of the *Calyx*. *Nut* single, conform to the drupe, brittle, though hard, black, two-celled, grooved on the sides, with the apex transversely two-toothed. *Seed* solitary, oval, flattened. *Integument* single, thin. *Perisperm* conform to the seed, soft and oily. *Embryo* inverse, nearly as extensive as the perisperm ; *cotyledons* ovate, cordate, obtuse. *Radicle* superior, oval.

SYMPHOREMA.

Calyx ; involucre, from six to eight-leaved. *Perianth* from six to eight-toothed. *Corol* one-petalled, from six to eight-cleft. *Capsule* none. *Seed* single, inclosed in the calyx.

S. *involucrata. Corom. pl.* 2. *N.* 186.

Teling. Suroodoo.

A large scandent shrub, a native of the Coromandel forests, &c. *Leaves* deciduous during the cold season, and coming out with the flowers in February, March, and April.

Stems woody, large, climbing. *Bark* ash-coloured. *Branches* straight, cross-armed. *Leaves*
II. opposite, short-petioled, ovate, grossly-sawed, downy ; about three inches long, and two broad.
263 *Peduncles* fascicled, from the extremities of the naked branchlets, and last year's axills, round, downy, each supporting a single umbellet. *Flowers* sessile, small, white. *Calyx ; involucre* from six to eight-leaved, from seven to nine-flowered ; *leaflets* chaffy, lanceolate, downy, permanent. *Perianth* inferior, one-leaved, tubular, from six to eight-striated, from six to eight-toothed, downy, permanent. *Corol* one-petalled ; *tube* short ; *border* from six to eight-cleft ; *divisions* linear, spreading. *Filaments* seven or eight, shorter than the corol, inserted just below its divisions. *Anthers* oblong. *Germ* superior, round. *Style* the length of the stamens. *Stigma* bifid. *Pericarp* none, the remaining withered calyx serving for one. *Seed* one, globular, smooth, the size of a pea.

I know of no use to which any part of this shrub is put, except that of fuel.

ALLOPHYLLUS. Schreb. gen. n. 643.

Calyx of two unequal pairs of suborbicular leaflets. *Corol* four-petalled, regular. *Stamina* regular. *Germ* two-lobed. *Stigma* bifid. *Berry* superior, two-lobed, with one seed in each.

A. *lanatus. Lourier. Cochin Ch.* 286.

Leaves ternate ; *leaflets* broad-lanceolate, serrate. *Racemes* axillary, simple. *Petals* equally disposed, and woolly on the whole of the inside.

A native of Pulo Pinang, Silhet, &c. It flowers in May. Arboreous ; young branchlets round, and smooth.

Leaves alternate, petioled, ternate. *Leaflets* subsessile, lanceolate, remotely and minutely serrate, smooth on both sides ; from four to six inches long. *Petioles* slightly channelled, smooth, about half the length of the leaflets. *Racemes* axillary, in pairs, or solitary, twice
II. the length of the petioles, simple. *Flowers* numerous, very small, collected in little, one-bracted
264 bundles. *Calyx* four-leaved ; *leaflets* roundish, the two exterior longer. *Petals* four, wedge-shaped, the whole of the inside very woolly, equally disposed round the stamina and pistil. *Filaments* eight, nearly the length of the petals. *Anthers* oval. *Germ* two-lobed. *Style* single. *Stigma* two-parted. *Pericarp* not seen.

ORNITROPHE. Juss.

Calyx of two unequal pairs of leaflets. *Corol* four-petalled, unilateral. *Germ* superior,

two-lobed, two-celled; cells one-seeded; attachment subinferior. *Berries* two (though it frequently happens that one is abortive) one-seeded. *Embryo* folded, with inferior radicle and no perisperm. Page Carey Ed.

1. O. *aporetica. R.*

Polygamous, shrubby. *Leaves* ternate; leaflets sessile, broad-lanceolar, acuminate, acutely serrate. *Racemes* simple. *Nectary* four-leaved.

Aporetica ternata. Forst. gen. N. 66.

Beng. Ghee-Kushee.

A shrubby species, about four or five feet in height; a native of the Silhet district where it blossoms in June.

Leaves alternate, petioled, ternate. *Leaflets* sessile, broad-lanceolar, remotely but acutely serrate, cuspidate, smooth on both sides, from four to six inches long, and from two to three broad. *Stipules* none. *Racemes* axillary, solitary, simple, erect, shorter than the leaves, villous. *Flowers* numerous, small, pale yellow, collected in little bundles, and embraced by some small, linear, villous bractes, many of them male. *Calyx* of two, opposite, rather unequal pairs of round concave leaflets. *Petals* four, unilateral, obovate, cuneate, emarginate, very woolly on the inside above the middle. *Nectary* within the base of each petal, a small, oblong, smooth, pale yellow leaflet. *Filaments* eight, ascending opposite to the petals, very woolly near the base. *Anthers* oval. *Germ* superior, in some of the flowers minute, and abortive, in others hairy, and two-lobed, with one ovula in each, attached to the lower, and inner angle of the cell. *Style* erect. *Stigma* of two revolute lobes. *Berries* two, when both come to perfection, which is not frequent, obovate, smooth, succulent; when ripe, red, the size of a large pea, one-celled. *Seed* conform to the berry, and attached to the bottom of the cell. *Integuments* two; exterior whitish yellow and thin; interior membranaceous. *Perisperm* none. *Embryo* conform to the seed, folded. *Cotyledons* unequal, fleshy, sublanceolar. *Radicle* taper-pointed, a little curved, inferior. II. 265

2. O. *villosa. R.*

Shrubby, tomentose. *Leaves* ternate; leaflets oblong, ventricose, remotely serrulate on the anterior margin. *Racemes* axillary, and terminal, simple. *Petals* cuneiform, the whole of the inside woolly.

A native of Chittagong.

Young shoots flexuose, very villous. *Leaves* alternate, ternate. *Leaflets* suboblong, ventricose, remotely serrulate, upper surface scarcely hairy, but soft with brownish short hairs underneath; from six to eight inches long and from four to five broad. *Petioles* long, round, and very villous. *Racemes* axillary and terminal, when in the axils, which is by far the most frequent, solitary, all are very hairy, generally shorter than the petioles. *Flowers* numerous, small, hairy, collected into little fascicles all over the raceme. *Bractes* subulate, very hairy. *Calyx* of two very equal pairs of opposite, roundish, concave hairy leaflets. *Petals* four, unilateral, cuneiform, very woolly over the whole of the inside. *Nectary*, a gland at the base of each petal on the inside, and without the stamina. *Filaments* eight, scarcely so long as the petals, surrounding the germ on all sides, woolly. *Anthers* oblong. *Germ* two-lobed, hairy, two-celled, with one ovula in each, attached to the bottom of its cell. *Style* short. *Stigmas* two, as long as the style, recurved. II. 266

3. O. *serrata. Willd.* 2. 322. *R. Corom. pl.* 1. *N.* 61.

Polygamous, shrubby. *Leaves* ternate; leaflets oval, serrate. *Racemes* axillary. *Petals* cuneate, woolly in the centre. *Berries* obovate.

Hind. Rakhal-phul.

Teling. Tauatikee.

It is one of the most common plants on the Coast of Coromandel; amongst the mountains it grows to be a small tree; on the low lands nearer the sea, it is always a ramous shrub, with grey spotted bark. It flowers during the wet season. It is also common in Bengal.

Leaves ternate. *Leaflets* ovate, pointed, serrate, generally bubbled, with frequently reflected *margins*, smooth on the back; from two to three inches long, and about one and a half broad. *Racemes* axillary, single, erect. *Flowers* numerous, small, white, fascicled. MALE and HERMAPHRODITE flowers mixed on the same tree, and sometimes on separate ones.

HERMAPHRODITE. *Calyx* four-leaved. *Petals* four, unilateral. *Nectarial* scales lacerated. *Filaments* very woolly near the base. *Germ* superior, two-lobed, with a single ovula in each, attached to the base of the partition. *Style* single. *Stigma* two-cleft. *Berry* succulent, generally single, the second lobe of the germ, being for the most part abortive, obovate, the size of a pea, smooth, bright red, one-celled. *Seed* conform to the berry. *Integuments* two, the exterior one white, thin, and rather hard like parchment, and in general larger than the embryo, which is closely embraced by the inner brown, rather spongy, somewhat double covering. *Perisperm* none. *Embryo* conform to the seed, folded. *Cotyledons* two, sublanceolate, thick, and fleshy. *Radicle* taper-pointed, inferior. MALE FLOWERS exactly like the Hermaphrodite, except the pistil, which is wanting, or at most only the rudiments of one are to be found. II. 267

The ripe berries are eaten by the natives. The root is astringent, and employed by the Telinga physicians in substance to stop Diarrhœas.

4. O. *glabra. R.*

Shrubby. *Leaves* alternate, ternate; *leaflets* oblong, smooth, serrate, with hairy glands in the axills of the veins. *Racemes* axillary.

Schmidelia *racemosa. Willd.* 2. 435.

Usubus *triphylla. Burm. ind.* 81. *t.* 32. *f.* 1.

The species I am now describing, was found at Chittagong by Mr. Roxburgh, and by

Page Carey Ed. him introduced into the Botanic garden at Calcutta, where it blossoms in May, and ripens its seeds in August and September.

Stem nothing that deserves the name, but several, spreading branches. *Bark* somewhat scabrous, with ferruginous spots. *Leaves* alternate, ternate, petioled. *Leaflets* oblong, subsessile, serrate, the point rather obtuse, having small hairy glands in the axils of the veins underneath, from two to four inches long, and from one to two broad. *Petioles* channelled, smooth, from one to two inches long. *Racemes* axillary, solitary, simple, erect, twice the length of the petioles. *Flowers* numerous, short-pedicelled, collected into little fascicles, many of which are male. *Bractes* minute, acute, one, two, or three, to each fascicle of flowers. *Calyx* of two unequal pairs of round, permanent leaflets, the inner pair much larger. *Petals* four,
II. placed on one side opposite to the stamens; cuneate, emarginate, on the inside of the exterior
268 half is a tuft of wool. *Nectary*, a yellow, somewhat crescent-shaped gland, between the petals and stamens. *Filaments* eight, as long as the petals, projecting in an ascending direction, woolly. *Anthers* roundish, incumbent. *Germ* superior, two-lobed, &c. as in *serrata*. *Style* short. *Stigma* two-cleft. *Berries* one or two, round, the size of a pea, when ripe red, pulpy. *Seed* solitary, the shape of the berry, and nearly the same size. *Embryo* as in *serrata*.

It differs from *serrata*; 1st. In being a spreading shrub, whereas that is erect and very ramous. 2ndly. In the young shoots, leaves and raceme being all very smooth, whereas there they are downy. 3rdly. and lastly. In the points of the leaves being rather obtuse, there acute. But in habit the difference is most striking, when seen growing together.

5. O. *Cobbe. Willd.* 2. 322.

Shrubby. *Leaves* ternate; *leaflets* subsessile, serrate, downy, the pair ovate, oblong, the terminal one broad lanceolar. *Racemes* axillary, simple.

Rhus *Cobbe, sp. pl.* 382.

I have seen only one dry specimen of this, it was given me by Dr. Rottler, under its old name (*Rhus Cobbe.*) The tender parts of the specimen are very downy, the leaves narrower, and less deeply serrate than *O. serrata*, which it resembles almost exactly in every other respect. The flowers are all *male*, or *male hermaphrodite:* and agree so exactly with those of that plant, that one description may serve for both.

6. O. *integrifolia. Willd.* 2. 322.

Leaves alternate; leaflets petioletted, oblong, entire. *Racemes* axillary, simple, as long as the leaves. *Petals* reniform, long-clawed.

II. A native of the Moluccas.

269 7. O. *repanda. R.*

Leaves ternate; *leaflets* ovate, repand, smooth. *Racemes* axillary, compound, shorter than the leaves. *Petals* obovate, short-clawed, very woolly on the inside.

A native of the Moluccas.

SCYTALIA. Schreb. gen. n. 671.

Calyx four or five-toothed. *Corol* none, or of four or five petals regularly disposed. *Germ* superior, two-celled, two-lobed, cells one-seeded; attachment inferior. *Style* two-cleft. *Berries* two, though rarely more than one comes to maturity. *Embryo* erect, without perisperm.

1. S. *Lichi. R.*

Polygamous. *Leaflets* four pair, lanceolate, acute. *Calyx* four-parted. *Corol* none. Fertile *germ* two-lobed; *fruit* oval, murexed.

Scytalia *Chinensis. Gœrt. sem.* 1. *t.* 42. *f.* 2.

Euphoria. *Juss. Gen. pl. p.* 274.

Dimocarpus. *Lichi Lour, Cochin Ch.* 287. *Willd.* 2. 346.

Sapindus *edulis, Hort. Kew.* 2. *p.* 30.

Chin. Lichi, or Lee chee.

This very famous tree is now common in Bengal. It was originally brought from China. Flowering time February and March. The fruit ripens three months afterwards. The trees in Bengal are as yet small, but I have seen them in China fully as large as a middling sized ash-tree; they are also somewhat like it in appearance, with numerous, spreading branches, and a smooth ash-coloured bark. Specimens of this tree have been sent to me from old trees growing on the Garrow mountains.

II. *Leaves* alternate, petioled, abruptly-pinnate. *Leaflets* from two to six pair, opposite, short
270 petiolleted, lanceolate, tapering to a long, fine point, very smooth and shining on both sides, of a firm texture, and almost veinless, from three to six inches long, and about one broad. *Panicles* terminal, large, oval, ramous, erect, or ascending, according to the direction of the branch that supports them. *Bractes* minute. *Flowers* small, greenish white, smell rather offensive. On some trees they are mostly hermaphrodite; while on others mostly male, but as far as I have observed never completely so.

HERMAPHRODITE. *Calyx* spreading, four, rarely five-lobed; both sides downy. *Corol* none. *Nectary* a large, fleshy, crenulate gland, into which the *stamens* and pistil are inserted. *Filaments* from six to eight, short, hairy, spreading. *Anthers* roundish, two-lobed. *Germ* superior, elevated on a short column, two-lobed, hairy, two-celled, each containing a single ovula, attached to the inner and lower angle of the cell. *Style* erect, rather short, hairy. *Stigma* two-cleft; *divisions* revolute. *Berry* generally single, though sometimes double, oval, the size of a pigeon's egg, covered with a thin, bright red, murexed bark; next under it is the pulpy aril, which is of a faint, transparent azure colour, and delicious subacid taste. *Seed* single, ob-

long, enveloped by the pulpy aril, smooth, brown and affixed by the base. *Embryo* erect, without perisperm, &c. as described by Gærtner. Page Carey Ed.

Male flowers mixed with the hermaphrodite. *Calyx* and nectary as in the former. *Corol* none. *Filaments* from six to eight, thrice as long as in the hermaphrodite. *Germ* smaller than in the former and always abortive. *Style* very short and entire.

Independently of the well known fruit of this tree, it is highly ornamental, being one of the most permanent ever greens we have in India.

2. S. *Longan. R.*

Leaflets four pair, lanceolate, obtuse. *Corol* five-petalled, fertile germ, often three-lobed, fruit round, slightly cabrous. II. 271

Beng. Ash-phul.

Chin. Longan.

Dimocarpus *Longam Lour. Cochin Ch.* 287.

This is also a tree, and more regular in form than the preceding species, having a short straight trunk with a large, very dense, globular head. The leaves are the same in situation, and composition, but obtuse, somewhat downy on the under side, and with large parallel veins. *Panicles* the same. It is also a native of *China*, as well as of the mountainous countries which form the eastern frontier of Bengal. *Flowers* small, pale yellowish white, male and hermaphrodite, mixed on the same panicle.

Hermaphrodite. *Calyx* deeply five-parted, downy on both sides. *Petals* five, inserted between the calyx and nectary, lanceolate, spreading, hairy. *Nectary* as in the former. *Stamens* also the same, but the *filaments* much more hairy. *Germ* superior, and frequently three-lobed with a three-cleft style, otherwise as in the former. *Berry* single, or double, rarely triple, round, the size of a large cherry, covered with a brownish grey, scabrous bark. Aril less in quantity than in the *Lichi*, and less grateful to the taste, but reckoned very wholesome. Seed solitary, round, smooth, and brown. *Embryo* as in the *Lichi*.

Male. *Calyx* corol, and nectary as in the hermaphrodite. *Filaments* long, and very hairy. *Pistil*, abortive, &c. as in the *Lichi*.

The wood of both trees is hard, close-grained and white; I do not find that it is yet employed for any purpose in Bengal.

3. S. *Ramboutan. R.*

Polygamous. *Leaflets* two or three pair, oblong or broad lanceolate. *Panicles* axillary. *Calyx* four and five parted. *Corol* none. *Berries* with dry echinate bark. II. 272

Nephelium *Cappacum. Linn. Syst.* 851. &c.

Dimocarpus *crinita Lourier. Cochin Ch.* 288.

Mal. Ramboutan, or Rambosteen.

From the Malay Islands it has been introduced into the Botanic garden at Calcutta.

4. S. *rimosa. R.*

Polygamous. *Leaflets* three or four pair, subopposite, lanceolate. *Panicles* axillary and terminal. *Corol* none. *Berries* oblong, rimose, tubercled.

Tengoori is the vernacular name in Silhet, where the tree is indigenous and grows to a large size; flowers in March and April, and the fruit which is generally eaten, ripens in August.

5. S. *rubia. R.*

Leaflets four or five pairs, lanceolate. *Panicles* terminal, and axillary. *Corol* of five, smooth, orbicular petals. *Fruit* oblong, smooth, purple.

Lall Koe-pooia is the vernacular name in Silhet, where the tree is indigenous, and grows to a moderate size. It blossoms in March; the fruit ripens in May and is eaten by the natives. *Bark* of the young branches and branchlets rather scabrous. *Leaves* alternate, abruptly-pinnate, from one to two feet long. *Leaflets* four or five pair, subopposite, lanceolate, entire, rather smooth, except while very tender, then villous underneath, from six to twelve inches long. *Petioles* cylindric, rather rough. *Panicles* terminal, and axillary, shorter than the leaves; ramifications alternate, smooth, and spreading much. *Flowers* numerous, small, rosy, or purple, according to the age. *Bractes* small, triangular. *Calyx* five-leaved; *leaflets* unequal, roundish, concave, coloured. *Petals* five, round, sessile, concave, smooth in every part. *Filaments* about eight, short, inserted on the base of the short column which elevates the pistillum. *Anthers* linear-oblong, incurvate. *Germ* superior, two-lobed, with one ovula in each, attached to the base of the partition. *Style* short. *Stigma* bifid; *segments* recurved. *Berries* one or two, the size and shape of an olive, smooth, dark purple; like the fruit of *Eugenia jambolana*, succulent, one-celled, the purple aril is eaten by the natives. *Seed*, solitary, the shape of the berry. *Integuments* two, exterior, ash-coloured, firm and thin; interior brown, softer, and thicker than the exterior. *Perisperm* none. *Embryo* erect. *Cotyledons* nearly equal. *Radicle* inferior, truncated. II. 273

6. *S. parviflora. R.*

Leaflets about seven, lanceolate, serrate, crenate. *Panicles* terminal. *Calyx*, and *Corol* of four leaflets, and petals.

A native of the Moluccas.

7. *S. oppositifolia. R.*

Leaves opposite, unequally pinnate, leaflets from three to five, lanceolate, remotely serrate, crenate. *Panicles* terminal.

A native of the Malay Islands.

8. *S. verticillata. R.*

Shrubby. *Leaves* simple, subverticelled, lanceolar, smooth, entire. *Panicles* terminal. *Pe-*

Page Carey Ed. *tals* five, with a woolly scale near the base. *Germ* two-lobed, elevated on a receptacle.

This pretty shrub, or small tree was brought to this garden from the Moluccas, with the spice plants in 1798, where it blossoms and ripens its seed at different periods through the year.

Trunk straight, with many straight branches, and tolerably smooth, brownish bark; height
II. of the plants, about seven feet, and are still growing fast. *Leaves* subverticelled, short-petiol-
274 ed, lanceolate, smooth on both sides, and entire; about six inches long and about two broad. *Stipules* none. *Panicles* terminal, many crowded together; also single from the exterior axills, erect, with numerous diverging ramifications. *Bractes* minute, caducous. *Flowers* short-pedicelled, small, pale yellow, with a tinge of red. *Calyx* of five, unequal, roundish, concave leaflets. *Petals* five, oblong, expanding, each with one villous, nectarial scale on the inside near the base. *Filaments*, about seven, short, erect, inserted on a short fleshy receptacle, which also elevates the pistil. *Anthers* erect. *Germ* superior, on a short fleshy receptacle, two-rarely three-lobed; *lobes* one-seeded, attached to the bottom of the cell, &c. *Style* very short. *Stigma* two pointed. *Berries* generally twin, oval, the size of a small coffee bean, pulpy, when ripe, orange-coloured, supported on a short common receptacle. *Embryo* erect, without perisperm.

9. *S. Danura. R.*

Shrubby. *Leaves* simple, broad-lanceolate, with a cordate base. *Panicles* terminal, petals five, with two woolly scales at their base. *Germ* two-lobed. *Style* scarcely any.

Beng. Danoora.

This tree is a native of the Delta of the Ganges and of the parts to the east of it. *Flowering* time the beginning of the hot season.

Leaves about the extremities of the branchlets, simple, subsessile, broad-lanceolate, smooth, entire, about a foot long. *Panicles* terminal, composed of rather remote, diverging, compound, ramifications. *Flowers* numerous, solitary, pedicelled, of a pale pink colour. *Bractes* minute, one-flowered. *Calyx* of five, unequal, roundish, concave leaflets. *Corol* of five equal, equally
II. disposed, oval, emarginate, short, clavate petals. *Nectary*, a double woolly scale at the base
275 of each petal on the inside, also a fleshy, crenulated ring round the germ, in which the stamens are inserted. *Filaments* from six to eight, half the length of the petals. *Anthers* erect, oblong. *Germ* two-lobed. *Style* rather shorter than the stamens. *Stigma* two-parted. In some flowers, (and they are, I suspect, always barren,) the Germ is small, and the style only a conical point between its lobes. *Berries* one or two-celled, the size of a field bean, and juiceless. *Seed* solitary.

It was formerly observed, that I thought it necessary to keep the first described two species of *Scytalia* distinct from the genus *Sapindus*, on account of the regular corol, or its entire absence; the same reason prevails here. To the former, Scytalia, I assign a regular corol with the stamens equally disposed on all sides; whereas to the latter I give an irregular corol, with ascending filaments.

SCHLEICHERA. Willd.

Polygamous. *Calyx* five-toothed. *Corol* five-petalled, or none. *Germ* superior, three-celled, cells one-seeded; attachment inferior. *Capsule* berried, entire, or three-valved. *Seeds* from one to three, arilled. *Embryo* naked, without perisperm, curved, erect.

1. *S. pentapetala. R.*

Leaflets from three to four pair, subalternate, lanceolate. *Flowers* five-petalled. *Capsule* one-seeded.

A pretty large tree, a native of the forests of Silhet, where it blossoms in March and April, and the fruit ripens during the rains. The male tree is there called *Koipoora* and the hermaphrodite, or fertile tree *Poora-Koi*. This sort is not eaten, the aril, the only edible part,
II. being very thin, and insipid.
276 *Young shoots* smooth. *Leaves* alternate, abruptly pinnate, from six to twelve inches long. *Leaflets* three or four pair, subopposite, lanceolate, entire, firm, lucid, obtusely acuminate, from four to eight inches long, and one or two broad. *Petioles* round, smooth. *Stipules* none. *Panicles* axillary, rather shorter than the leaves, crowded with numerous ramifications, and cloathed with soft down. *Flowers* small, and very numerous, of a dull yellowish green. MALE. *Calyx* five-parted; *segments* broad-cordate, a little hairy. *Petals* five, lanceolate, with two small, smooth, incurved scales at the base, as in the *Sapindi*. *Nectary* a torulose hairy ring between the insertions of the petals and filaments. *Filaments* seven or eight, the length of the petals, or longer. *Anthers* two-lobed. *Germ* an oblong gland.

HERMAPHRODITE and MALE flowers on a separate tree. *Calyx, corol,* and *nectary* of the hermaphrodite, like those of the male. *Filaments* shorter, but the *anthers* as in the male. *Germ* oblong, three-celled, with one ovula in each, attached to the bottom of its cell. *Style* scarcely any. *Stigma* of three recurved lobes. *Capsule* the size of a black currant; tapering into a pedicel at the base, marked with three sutures on the outside, generally one-celled, three-valved; the *valves* containing little cells filled with a fragrant balsam. *Seed* generally solitary, the size of a small pea, round, enveloped in a thin, succulent aril. *Integuments* single, smooth, brown. *Perisperm* none. *Embryo* curved, erect, greenish. *Cotyledons* unequal, one-curved, the other, viz. the inferior one, doubled. *Radicle* conical, curved, inferior, its apex touching one side of the umbilicus.

The seed vessel of my other species. *S. trijuga. Willd.* 4. 1096. *Koon. Gært. sem.* 2. 486. *t.* 180. does not open spontaneously as in this, and sometimes contains three seeds, enveloped in a thick, succulent, subacid, edible aril. The proper integument is there also single; nor is there

any perisperm, but both the cotyledons are doubled, and equally long. 277.

2. S. *trijuga. Willd.* 4. 1096.

Leaflets three pair, lanceolate. *Flowers* apetalous.

Koon. Gært. sem. 2. *p.* 486. *t.* 180. *f.* 11.

Cing. Coughas.

Tam. Zolim-buriki.

Teling. May, or Roatangha.

A stout, handsome middling sized tree, a native of various parts of India. *Flowers* about February. The fruit ripens in May. It is allied to Melicocca, and Scytalia, probably not sufficiently removed from the former to authorize its forming a new genus. The pulpy subacid aril, is edible, and palatable.

Leaves about the extremities of the branchlets, abruptly pinnate, from eight to sixteen inches long. *Leaflets* from two to four pair, opposite, sessile, broad-lanceolate, or oblong, entire, pretty smooth on both sides; the lower pairs the smallest; from three to eight inches long. *Petioles* a little downy, from six to sixteen inches long. *Stipules* wanting. *Racemes* axillary, or below the leaves, round the base of the young shoots, solitary; in the male simple; in the hermaphrodite often compound; from two to four inches long.

Male. *Calyx* cup-formed, five-toothed. *Corol* none. *Filaments* from six to ten, erect, many times longer than the calyx. *Anthers* oval, erect. *Pistil*, merely the rudiment of one.

Hermaphrodite flowers on a separate tree. *Calyx* as in the male. *Corol* none. *Nectary* a fleshy, yellow ring surrounding the insertions of the filaments. *Stamens* as in the male. *Germ* superior, ovate, three-celled, with one ovula in each, attached to the bottom of the cell. II. *Style* short. *Stigma* three-cleft, recurved, slender, downy. *Drupe* the size of a nutmeg, a 278 little pointed, covered with a tender, dry, grey bark. *Seeds* one, two or three, oblong, smooth, at the base obliquely truncate, and there affixed, each surrounded with its proper whitish, pulpy aril, which is of a pleasant acid taste, and is most grateful during dry weather. *Embryo* doubled, with inferior radicle and no perisperm.

The bark is astringent, rubbed up with oil, the natives of these parts use it to cure the itch. The wood is hard, and employed for many purposes by the natives.

SAPINDUS.

Calyx from four to five leaves. *Corol* from four to five petalled, in some unilateral. *Germ* superior, three celled, cells one-seeded; attachment inferior. *Berries* three, superior, more or less united. *Seed* solitary. *Embryo* erect, curved, or straight, no perisperm.

1. S. *laurifolius. Willd.* 2. 469. *Vahl. symb.* 3. 54.

Leaflets three-pair, ovate, lanceolate, smooth, rachis simple. *Panicles* terminal. *Petals* five, lanceolar, equally woolly all over the inside.

A stout, very shady tree, a native of various parts of India. *Flowering* time December; the seed ripens in April.

Trunk straight, when full grown as thick as a man's body. *Bark*, a mixture of ash and olive colour. *Branches* numerous, spreading much in every direction. *Leaves* alternate, abruptly pinnate. *Leaflets* three pair, though sometimes next to the panicles two pair, obliquely ovate-lanceolate, taper-pointed, entire and smooth on both sides; veins elevated and whitish; from four to six inches long. *Petioles* round. *Petiolets* short and rugose. *Panicles* terminal, broad-ovate, large, and very ramous; *ramification* rather scaly. *Bractes* minute. II. *Flowers*, numerous, small, short-pedicelled, dull white. *Calyx* five-leaved; *leaflets* oval, vil- 279 lous on the outside, and margin. *Petals* five, lanceolar, equally woolly over the whole of the inside, and without any appearance of the nectarial scales on the base, or margin, as in all the other species described by me, clothed on the outside with appressed brown hairs. *Filaments* woolly, shorter than the germ, and inserted between it and the five-lobed, hairy *receptacle*. *Germ* three-lobed, very hairy, three-celled, with one ovula in each, attached to the bottom of the axis. *Style* simple. *Stigma* three-toothed. *Berries* three, united, singly, the size of a cherry, when ripe soft, and of a yellowish-green colour, with a few brown hairs scattered over them; one-celled. *Seed* round-obovate. *Integuments* two, the *exterior* one thick, tough and hard, smooth and black; the *inner* one membranaceous. *Perisperm* none. *Embryo* conform to the seed, uncinate. *Cotyledons* unequal, thick, firm, fleshy, spirally incurvate, colored with a tinge of green. *Radicle* inferior, linear, lodged at the base of the seed, pointing to the lower and inner angle.

The berries are saponaceous, and used with those of the other species of the same nature.

2. S. *emarginatus. Vahl. symb.* 3. 54. *Willd.* 2. 469.

Leaflets two or three pair, oblong, retuse, or emarginate. *Panicles* terminal. *Calyx* and *Corol* of five equal, regularly disposed leaflets, and petals, with a woolly scale on each side of the latter.

Beng. Bura-reetha.

Teling. Konkoodoo.

A handsome, middling-sized tree, with a short trunk, and very large, dense, spreading head, decorated with beautiful thick, deep green foliage the whole year. *Flowering* time in Bengal, October; the seeds ripen in April.

Leaves alternate, abruptly pinnate, from six to ten inches long. *Leaflets* generally two II. pair, opposite, short petiolated, oblong, with entire margins, and rounded emarginate apex, 280 smooth, of a shining deep green, and downy underneath. *Petioles* round, villous. *Stipules* none. *Panicles* terminal, crowded with numerous ramifications of small, whitish, inodorous blossoms. *Bractes* small, caducous. *Calyx* of five, equal, oblong leaflets. *Petals* five, equal, re-

Page Carey Ed. gularly disposed, oblong, or lanceolate, outside hairy, with two inflected woolly tufts on their margin near the middle. As in most, if not all, the other species, there is a notched, fleshy, hairy ring between the insertion of the petals and stamina. *Filaments* eight, short, woolly. *Anthers* two-lobed. *Pericarp*, drupes from one to four, though three is the most common number, slightly conjoined, singly, somewhat of an oblique-ovate shape, with an elevation running from the base to the apex on the outside, smooth until wrinkled by age in drying, lined on the inside with a smooth, tough membrane, except round the insertion of the seed, and there hairy, as in S. *detergens*. *Seeds*, or nuts solitary, round, smooth, dark-coloured, indeed almost black ; size of a large marrow-fat pea, unilocular thick and exceedingly hard.

The leaflets in this species are always very obtuse, and generally emarginate ; this circumstance, together with a calyx, and corol of five parts, induces me to think *Gærtner's Sapindus rigida, p.* 341. 70. *f.* 3, must be another species.

3. S. *detergens. R.*

Polygamous. *Leaflets* from four to five pair, subalternate obliquely ovate-oblong, obtuse. *Petioles* simple. *Flowers* panicled. *Calyces*, and *corols* of five, equal, regularly disposed leaflets, and petals.

Hind. and *Beng.* Reetha.

II. *Sans. Urista.*

281 I have found this tree only in Bengal, though a native of most parts of India. Flowering time the beginning of the hot season.

Trunk straight; *branches* also nearly erect, and few of them. *Bark* smooth, and ash-coloured; height of the tree generally about twenty feet. *Leaves* alternate, about the ends of the branchlets alternately pinnate; from six to twelve inches long. *Leaflets* subalternate, from eight to twelve in number, or from four to six pair, entire, obliquely lanceolate, oblong, smooth on both sides, and about four inches long. *Petioles* common, round, flexuose, smooth. *Panicles* terminal, and from the exterior axils, diffuse, composed of diverging, compound ramifications. *Calyx* five-leaved. *Petals* five, equal, and regular. *Nectary*, two woolly scales near the base of each petal. *Stamens* six or eight ; *filaments* woolly. *Germ* three-sided, sitting, with the stamens, on a large glandular receptacle. *Style* single and short. *Drupes* generally solitary, seldom more than one coming to maturity, one-celled, subglobular, very smooth, and yellow, with a pretty large ridge round the base on the outside, the inside marked with the two abortive lobes of the germ. *Nut* solitary, round, and smooth, affixed to the inside of its cells, where a considerable quantity of woolly fibres intervene.

With the pulp of the fruit the Hindoos wash linen, &c.

In January, 1808, a healthy young tree of about twenty feet in height, reared from seed, received from North America, under the name *Sapindus Saponaria*, flowered abundantly, and ripened many seeds. It differs from my detergens ; 1st. in being a larger tree, and more ramous. 2nd. In the leaflets being acute, and lanceolar, that is taper at each end. 3rd. In the calyx, and corol consisting of six parts each, which are round, and shorter than the germ ;
II. and in the petals being without the two woolly scales, so conspicuous in *detergens*. I there-
282 fore conclude they are distinct species, and doubt if the American tree is to be found indigenous in India, probably not in Asia.

4. S. *squamosus. R.*

Leaves pinnate ; *leaflets* about three-pair, sub-opposite, obliquely ovate, lanceolate, acute, polished, entire. *Panicles* axillary and terminal. *Petals* five, regular, with two very large woolly scales. *Filaments* and *Germs* woolly.

A native of the Malay Archipelago ; my specimens were gathered on the Island of Nasaulant.

Young shoots straight, round, and a little villous. *Leaves* alternate, pinnate, sometimes abruptly, sometimes unequally, about six inches long. *Leaflets* about three pairs sub-opposite, short-petiolëtted, obliquely ovate-lanceolate, rather unequally divided by the nerve, entire, acute, firm and polished, about three inches long. *Petioles* round, villous. *Panicles* axillary, and terminal, the length of the leaves. *Flowers* numerous, small. *Calyx* five-cleft, hairy. *Petals* five, equal. *Nectarial* scales very large, and very woolly. *Filaments* eight, equally disposed, woolly, inserted on the inner edge of a glandular ring which separates them from the petals. *Germ* woolly.

5. S. *longifolius. Willd.* 2. 469.

Leaflets from four to eight pair, subalternate, short-petioletted, entire, linear-lanceolate, obtuse, the most inferior pair or two oblong. *Panicles* terminal. *Corol* regular, five-petalled.

A native of the Moluccas.

6. S. *rubiginosus. Willd.* 2. 469. *R. Corom pl.* 1. *N.* 62.

Arboreous, unarmed. *Leaves* abruptly pinnate; *leaflets* from four to five pair, lanceolate, villous. *Panicles* terminal. *Calyces* five-leaved. *Corol* four-petalled. *Style* and *Stigma*
II. single. *Berries* distinct, oblong.
283 *Teling. Ishee-rashee.*

A large timber tree, a native of the mountainous parts of the Circars. It flowers about the beginning of the hot season.

Trunk perfectly erect, of considerable length and thickness. *Branches* numerous, ascending. *Branchlets* clothed with ferruginous pubescence. *Leaves* alternate, abruptly pinnate, about a foot long. *Leaflets* opposite, from four to six pair, sublanceolar, entire, above smooth, downy underneath ; from three to six inches long, and from one to two broad. *Petioles* round, downy, ending in a downy bristle. *Panicles* terminal, large, erect, composed of simple racemes. *Calyx* five-leaved. *Petals* four, placed on the upper side, an entirely woolly scale arises

from the base on the inside of each. *Style* single, ascending, shorter than the stamens. *Berries* three when all come to perfection, which is rarely the case, singly oblong, one-celled. Page Carey Ed.

The wood of this tree is very useful for a great variety of purposes; being large, straight, strong, and durable, towards the centre it is chocolate-coloured.

7. S. *fruticosus. R.*

Shrubby. *Leaflets* from three to four pair, lanceolar, with an orbicular pair inserted on the base of the common petiole. *Petals* with small woolly scales at the base.

It is a native of the Moluccas, and from thence introduced into the Botanic garden at Calcutta in 1798, where it blossoms in March, and the fruit ripens in May and June.

The plants are as yet (1809) but small, but with an erect trunk, covered with smooth ash-coloured bark. The branches are few, weak, and much bent, even so as to be cernuus.

Leaves abruptly pinnate, about a foot long. *Leaflets* three or four pair, generally alternate, subsessile, lanceolar, entire, of a firm texture, and smooth on both sides; from three to six inches long, (the exterior largest,) and from one to two inches broad. *Petioles* round, smooth. *Stipules*, or inferior pair of leaflets very remarkable, smooth, round cordate, inserted on opposite sides of the base of the common petiole. *Inflorescence* for the most part axillary racemes, though sometimes terminal panicles, composed of but few, expanding ramifications. *Flowers* small, with a ferruginous calyx, and white corol. *Bractes* solitary, one-flowered, subulate. *Calyx* of four smooth, suborbicular, ferruginous leaflets. *Petals* four, suborbicular, rather larger than the calyx, near the base of each is a double tuft of wool. *Filaments* eight, shorter than the corol, inserted into a woolly receptacle, which also receives the base of the germ. *Anthers* ovate. *Germ* superior, two or three-lobed, from two to three celled, each containing one *ovula* attached to the bottom of the cell. *Style* none. *Stigma* large, glandular, two-lobed. *Berry* two or three-lobed, size of a small cherry, of a bright, smooth, shining black colour, the pulp is in large proportion, and of a pleasant sweetish astringent taste. *Seeds* one in each lobe of the berry. *Embryo* erect, without a perisperm. II. 284

8. S. *serratus. R.*

Leaflets numerous, alternate, lanceolate, serrate; *rachis* simple. *Panicles* subterminal. *Petals* five, regular, with two very hairy clavate scales near the base.

A native of the Moluccas.

OCTANDRIA TRIGYNIA. II. 285

POLYGONUM. Schreb. gen. n. 677.

Calyx none. *Corol* five-parted resembling a calyx. *Seed* solitary.

Sect. Style two-cleft. *Seed* without angles.

1. P. *nutans. R.*

Annual, suberect, ramous. *Leaves* lanceolate. *Stipules* not bearded. *Corols* four-cleft. *Stamens* five. *Styles* two. *Seed* roundish, compressed.

Several plants came up accidentally in the Botanic garden at Calcutta, but from whence the seed came I cannot be certain.

Stem short, erect, soon dividing into many, first spreading, then ascending branches, covered with red bark, and maculated with still darker red, with a few short, white, stiff hairs, scattered over every part, as also over the underside of the nerves of the leaves. *Leaves* short-petioled, lanceolate, margins a little curled, and somewhat waved. *Stipules* membranaceous, smooth, truncated, not ciliate. *Racemes* terminal, and from the exterior axils, cylindric, nodding, most completely covered with numerous, small, white flowers. *Bractes* somewhat fringed. *Corols* four-cleft, opposite; *divisions* a little unequal. *Stamens* five. *Styles* two. *Seed* roundish, pointed, much compressed, smooth.

2. P. *lanatum. R.*

Procumbent, with erect branches. *Leaves* linear-lanceolate, woolly; *sheathes* lacerated. *Corol* four-cleft. *Styles* two-cleft. *Stamens* six. *Seeds* round, compressed.

Beng. Swet-panee-murich.

Annual, growing in ditches, &c. near Calcutta; and flowering during the rains. II. 286

Stems herbaceous, jointed, below procumbent, and striking root from the joints that rest on the ground; above erect, internally of a deep red colour, particularly at the joints, height various. *Leaves* short-petioled, narrow-lanceolate, entire, hoary underneath, long and about one inch broad, withering on the plant. *Stipules* nearly as long as the joints, striated, woolly, having their mouths lacerated, but not bearded. *Racemes* terminal, peduncled, erect, crowded with numerous, small, white flowers. *Bractes* many-flowered, &c. as in the other species. *Calyx* four-parted. *Stamens* six. *Style* two cleft. *Seed* round, pointed, much compressed, smooth, of a shining brown colour.

3. P. *pilosum. R.*

Erect, annual, hairy. *Leaves* long-petioled, ovate-cordate, downy; the mouth of the sheaths spreading open. *Style* two-cleft. *Stamens* from seven to eight. *Seeds* round, compressed, and somewhat thin at the edge.

Beng. Bara-panee-murich.

Lagunea *Cochin Chinensis. Lourier Flor. Cochin Ch.* 272.

Common near Calcutta, on the borders of such places as are inundated during the rains. Flowering time the beginning of the wet season.

Stems annual, suberect, branchy, the whole plant from two to four feet high, and covered

Page Carey Ed. with many soft greyish hairs. *Leaves* alternate, petioled, ovate-cordate, decurrent on the petiole, pointed, entire, both sides covered with much soft down, six inches long, and three broad. *Petioles* two inches long, inserted into the stipules. *Stipules* sheathing, hairy, striated, truncated, having the mouths ciliated, sometimes expanded, sometimes closely embracing the stem. *Racemes* long-peduncled, crowded with small white flowers. *Stamens* seven, five in the fissures of the corol, and two embracing the germ. *Style* half two-cleft. *Stigmas* globular. *Seed* round,
II. compressed, smooth, brown.
287 *Note.* The ends of the succulent branches, after being wetted became covered with a clear thick gluten.

4. P. *tomentosum. Willd.* 2. 447.

Annual, suberect. *Leaves* lanceolar, silky; *sheaths* and *bractes* bearded. *Stamens* seven or eight. *Stigma* two-cleft. *Seed* round.

Teling. Yeatee-mallier.

Persicaria maderaspatana. *Pluk. t.* 210. *f.* 7. *good.*

This plant is annual, a native of ditches, rivulets, &c. appearing during the wet season.

Stems several, below procumbent, and there rooting at the joints, above erect, jointed, with but few branches; from two to four feet high. *Leaves* broad-lanceolar, short-petioled, silky, entire; from four to six inches long, and from one to two broad. *Stipules* long, sheathing the stem, with the petioles issuing from it a little above its base, lobed, having the *mouth* bearded. *Racemes* (generally from three to five,) terminal, or from the exterior axills, erect, peduncled, hairy. *Bractes* a large exterior one at each joint, which embraces the rachis, and fascicle of flowers; this is unequally lobed, and its mouth much bearded; besides this there is another common one which embraces the fascicle of flowers only; within it each flower has its proper bracte, these are not bearded. *Flowers* numerous, small, white, from six to eight at each joint, or set of bractes, but always expanding in succession. *Stamens* seven or eight. *Style* two-cleft, shorter than the stamens. *Seed* round, compressed, not in the least angular.

Cattle eat it greedily.

5. P. *glabrum. Willd.* 2. 447.

Annual, suberect, smooth, reddish. *Leaves* narrow-lanceolar. *Stipules* a little ragged. *Stamens* seven. *Style* three-cleft. *Seed* round.

II. Schovanna mudela muccu. *Rheed. Mal.* 12. *t.* 77.
288 Annual, a native of the same places as the other species are, but less common. It is a much more elegant, delicate looking plant.

Stems as in the last species, but deeply tinged with red. *Leaves* short-petioled, linear-lanceolar, tapering much towards each end, smooth on both sides, entire, from five to seven inches long. *Stipules* sheathing, lobed, short, smooth, adhering firmly to the stem; mouth a little ragged, but not ciliated. *Racemes* as in P. *tomentosum*, but longer, slender and smooth. *Bractes* as in the former, but without a beard. *Flowers* numerous, rose-coloured, three or four in each set of bractes, appearing in succession, heptandrous. *Style* three-cleft, twice as long as the stamens. *Seed* ovate, compressed, not in the least angular.

6. P. *perfoliatum. Willd.* 2. 454.

Prickly, scandent, perennial. *Leaves* triangular. *Stipules* ample, round-oval, spreading, perfoliate. *Style* three-cleft. *Seed* round.

A native of various parts of India. From Nepal the seeds were sent by Dr. Buchanan to the Botanic garden at Calcutta, where the plants thrive well, and blossom most part of the year.

Stems and *branches* slender, scandent to a considerable extent, armed with numerous, acute, recurved prickles, but without pubescence. *Leaves* long-petioled, somewhat peltate, triangular, entire smooth on both sides, except a few, very minute prickles on the underside of the nerve and veins; size various, from one to three inches each way. *Petioles* as long as the leaves, armed. *Stipules* large, round, oval, surrounding the branch, or branchlet immediately within the insertion of the leaves; smooth and unarmed. *Spikes* terminal, solitary. *Bractes* cordate, spike-clasping. *Stamens* from eight to ten. *Style* three-cleft. *Seed* round, smooth, shining black, hid in the enlarged, livid, fleshy calyx, and in that state appear a berry.

II. It is probably a *Coccoloba*.
289 7. P. *Chinense. Willd.* 2. 453.

Scandent, flexuose. *Leaves* oblong, with truncate base. *Bractes* ear-shaped. *Peduncles* terminal, subpanicled; *flowers* in globular pedicelled heads.

A native of the eastern parts of Bengal. Flowers in February, March, and April.

8. P. *cymosum. R.*

Shrubby, scandent, ramous. *Leaves* ovate-lanceolate, entire, acute, smooth. *Cymes* terminal; flowers in small heads, octandrous.

A native of Chittagong, where it flowers in April.

Sect. 2. *Style* three-cleft. *Seed* three-sided.

9. P. *tenellum. R.*

Annual, flaccid, ramous. *Leaves* lanceolar, with bearded sheaths. *Racemes* filiform, fascicles of flowers remote. *Tube* of the corol internally ribbed. *Stamens* from seven to eight. *Styles* three. *Seed* three-sided.

Found in ditches, &c. low wet places all over Bengal. Flowering time the rainy season.

Root fibrous, often biennial, if not perennial. *Stems* several, ramous, weak and straggling, slender, and smooth. *Leaves* subsessile, lanceolar, entire, smooth. *Stipules* on the outside furrowed, otherwise smooth, having their *mouths* crowned with long distinct filaments. *Racemes* terminal, often subpanicled, filiform. *Bractes* rather remote, obliquely truncated, ciliate,

outside glandular. *Flowers* small, white. *Corol*, the mouth of its tube contracted with ridges, alternate, with the insertions of the filaments. *Stamens* eight. *Styles* three. *Seed* three-sided. Page Carey Ed

10. *P. barbatum. Willd.* 2. 447.

Branches erect, ramous, smooth. *Leaves* lanceolar, smooth. *Stipules* bearded, and hairy. *Racemes* twiggy, with fascicles of flowers rather remote. *Stamens* eight. *Style* three-cleft. *Seed* three-sided. II. 290

Teling. Kunda-mallier.

It is a native of moist, or wet places amongst the mountains.

Stems several, erect, ramous, slender, smooth, from three to four feet high, joints a little swelled. *Leaves* short-petioled, lanceolar, smooth, from three to five inches long. *Stipules* as long as in P. *tomentosum*, mouth much ciliate, the whole outside hairy. *Racemes* terminal, long, twiggy, short-peduncled; fascicles of flowers rather remote. *Bractes* as in the former species, the exterior one ciliate and hairy. *Flowers* rose colour, numerous, in succession from the same set of bractes, octandrous. *Style* three-cleft, length of the stamens. *Seed* three-sided.

Cattle are fond of all these four species.

11. P. *rivulare. Kon. Mss.*

Annual; branches erect. *Leaves* narrow-lanceolate, pretty smooth. *Stamens* eight. *Style* three-cleft. *Seed* three-sided.

Velutta modela muccu. *Rheed. Mal.* 12. *t.* 76.

Annual, a native of similar places with the last two species, has nearly the same appearance and habit, but is rather more slender than even P. *glabrum.*

Leaves narrow-lanceolate, entire, pretty smooth; from five to six inches long. *Stipules* short, obliquely lobed, much ciliate. *Racemes* as in the last described species. *Bractes* as in the former two, the exterior one is here bearded. *Flowers* numerous, crowded, from three to four to the set of bractes, also in succession. *Stamens* eight. *Style* three-cleft, twice as long as the stamens. *Seed* three-sided.

Note. The three-sided seed and three-cleft style, distinguish it from *P. tomentosum.*

12. P. *flaccidum. R.* II. 291

Annual, flaccid, smooth. *Leaves* lanceolate, with cordate base, smooth. *Stipules* long, ciliate. *Stamens* eight. *Style* three-cleft. *Seed* three-sided.

Beng. Panee-murich.

A native of ditches, &c. near Calcutta; flowering time the wet season.

Stem scarcely any, but many, slender, straggling, smooth, jointed, round branches. *Leaves* sessile, from the base of the stipules, lanceolate, with the base cordate, entire, and smooth on both sides; from one to six inches long. *Stipules*, bristles on the outside; *mouths* long ciliate. *Racemes* terminal, subcylindric, crowded with small, white flowers. *Bractes* ciliate. *Stamens* eight. *Style* half three-cleft. *Seed* three-sided, smooth, of a dark brown colour.

13. P. *elegans. R.*

Perennial, prostrate. *Leaves* lanceolar. *Flowers* axillary, crowded. *Stamens* eight. *Stigma* three-cleft. *Seed* three-sided.

A native of dry, uncultivated ground, appearing and flowering chiefly in the dry season.

Root simple, very long, yellow. *Stems* numerous, prostrate, from six to twelve inches long. *Branches* numerous, bifarious. *Leaves* alternate, bifarious, very short-petioled, lanceolar, dotted with small glandular points, smooth, margins red; about half an inch long. *Stipules* sheathing, membranaceous; *mouth* torn, and ciliated. *Bractes* sheathing, membranaceous. *Flowers* axillary, peduncled, small, rose-coloured, octandrous. *Calyx*, the three interior divisions obtuse, the two exterior pointed. *Styles* three, very short. *Seed* three-sided, with sharp angles.

14. P. *horridum. Buch.*

Scandent, angular; the angles armed with recurved, sharp aculei. *Leaves* sessile, linear, with a cordate base; *sheaths* fringed. *Spikes* terminal, subcylindric subpanicled. II. 292

A native of the eastern parts of Bengal.

15. P. *fagopyrum. Willd.* 2. 455.

Stem nearly erect, unarmed. *Leaves* petioled, cordate, sagittate. *Flowers* in loose spikes; angles of the seed equal.

Found cultivated all over the mountainous countries north of Bengal, Oude, &c.

COCCOLOBA. Schreb. gen. n. 678.

Calyx beneath, five-parted, coloured. *Corol* none. *Berry* calycine, one-seeded.

C. *crispata. Buch.*

Perennial. *Leaves* short-petioled, ovate-oblong, margins finely curled, smooth; *Sheaths* membranaceous, truncate. *Panicles* terminal, composed of numerous heads, on glandular peduncles.

A native of Nepal. In the Botanic garden at Calcutta it blossoms during the cold season.

CARDIOSPERMUM. Schreb. gen. n. 680.

Calyx from four to five-leaved. *Corol* four-petalled. *Nectary* four-leaved, unequal. *Capsules* three, united, inflated. *Seed* solitary, globular.

C. *halicacabum. Willd.*

Scandent, five-seeded. *Leaves* compound, gashed, smooth. *Tendrils* umbelliferous.

Sung. Jyotishmutee.

Page Carey Ed.

Beng. Noaphutki Sibjhool.
Teling. Nalla goolisienda.
Very common all over the southern parts of India, and in flower, and seed all the year.

II. 293

OCTANDRIA TETRAGYNIA.

ODINA. R.

POLYGAMOUS. HERMAPHRODITE. *Calyx* four-toothed. *Corol* four-petalled. *Germ* one-celled, *ovula* single, pendulous. *Drupe* superior, one-seeded. *Embryo* inverse, without perisperm.

MALE. *Calyx* and *Corol*, as in the Hermaphrodite.

O. *wodier. R.*
Sang. Jeevula.
Beng. Jiyal.
Teling. Gampina.
Hind. Kushmulla, Kashmulla, Kimul, &c.

It is a very large tree, a native of most mountainous parts of the coast, Bengal, &c. it is also frequently found in a cultivated state, chiefly about Madras where the sides of the roads are lined with them. It grows readily from cuttings, which is I believe, the chief inducement for employing it; for it is without leaves from the beginning of the year, till April or May, a season when shade is particularly wanted, for after that the weather, in general, becomes more clouded. Flowering time March and April, when it is perfectly naked of leaves. Nor could the flowers be any inducement to have it near the houses; in short there is nothing in its favour, but its growing easily and quickly.

The following description is taken from the tree in its wild state amongst the Circar mountains.

Trunk straight to the branches, of no great height but very thick. *Bark* pretty smooth, ash-coloured. *Branches* numerous, the lower spreading, the upper ones disposed in every di-
II. rection. In a cultivated state it is generally pruned very close once in two or three years, which
294 makes the branches shoot more erect, but takes away from the native beauty of the tree, and renders the shade when in foliage much less extensive, than in its natural state. *Leaves* alternate, about the ends of the branchlets, pinnate with an odd one, from twelve to eighteen inches long. *Leaflets* generally three or four pair, opposite, sessile, oblong, ovate, pointed, smooth, entire; about five inches long, and two broad, the exterior ones largest. *Racemes* terminal, filiform, pendulous if long, which they generally are, if short spreading. *Bractes* minute, falling. *Flowers* small, purple, inodorous.

In general the *Hermaphrodite* and *Male* flowers (there are no other sort that ever I saw,) are on the same tree, and even mixed on the same racemes; the male are by far the most numerous; sometimes but rarely they are on a separate tree.

HERMAPHRODITE. *Calyx* four-toothed, small, permanent. *Petals* four, oblong, concave, spreading. *Filaments* eight, spreading, rather shorter than the petals. *Anthers* ovate. *Germ* superior, oblong, one-celled, containing one *ovula* attached to the top of the cell. *Styles* four, short, erect. *Stigmas* simple. *Drupe* kidney-form, smooth, the size of a large french bean, when ripe red, one-celled. *Nut* the shape of the berry, one-celled. *Seed* conform to the nut; no perisperm. *Embryo* inverse, curved.

MALE. *Calyx*, *Corol*, and *Stamens* as in the hermaphrodite. *Pistil* the rudiments of a germ, with a short, four-toothed style.

The wood of old trees is close grained, of a deep reddish mahogany colour towards the centre. This coloured part is serviceable for many uses, and looks well. The white wood is fit for no use that I know of.

From wounds in the bark there issues a gum, which, when dry, is much like pieces of dry glue; but I know of no use it is put to.

This is the tree Dr. Anderson calls *Wodur* in his miscellanies.

II. 295

CLASS IX.

ENNEANDRIA MONOGYNIA.

LAURUS. Schreb. gen. n. 688.

Calyx one-leaved, six-cleft. *Corol* none. *Anthers* four-celled. *Germ* superior, one-celled; attachment superior. *Berry* superior, one-seeded. *Embryo* inverse, without perisperm.

SECT. 1. *Leaves opposite.*

1. L. *Cinnamomum. Willd.* 2. 477.

Leaves opposite, ovate-oblong, three-nerved. *Panicles* terminal, with the extreme ramifications three-flowered. *Nectarial glands* sagittate.

Cinnamomum foliis latis, &c. *Burm. zeyl.* 62. *t.* 27.

Kasse Koronde of the same. Page Carey Ed.

Dar-cheen*i*, often pronounced dal-cheen*i*, the Persian, Hindee and Bengalee name of Cinnamon. Twuk-pu*tra*, *Ootkuta*, Bhri*ga*, Twu*cha*, Cho*cha*, Vu*ranguka*, are some of the numerous Sanscrit names of Cinnamon, and Dr. Carey says the last three are also given to the bark of *Laurus Cassia*, commonly called *Cassia lignea*, or *Cassia* bark.

This well known tree seems still to require a little illustration, particularly as there are no doubt several varieties, if not species, included under this name. When General Hay Macdowal was in command on the Island of Ceylon, he sent to the Botanic garden at Calcutta in 1801, several plants of the first, or best sort; called by the Cingalese *Kasse Koronde*. These plants have now, 1810, attained to the height of twenty feet; the trunk is short, and from II. sixteen to eighteen inches in circumference. The bark thereof scabrous, and considerably 296 cracked in various directions, that of the younger parts smooth. The head remarkably ramous, large, and dense, for the last three or four years they have flowered freely during the months of January and February; and ripened abundance of berries. It is from these the following description was taken. The drawing and description, No. 1058,* was made from young trees, which were reared by me at Samulkota, from the seeds of the trees growing in Tinnevellee, near Palamkotta, which were procured from Ceylon in 1781 or 1782, and which differ from this in the leaves being much narrower at the base, in short, broad-lanceolar, and the three nectarial glands clavate. The sort introduced into Bengal by Mr. Hastings, between thirty and forty years ago is of this narrow leaved inferior kind.

Descriptions of Kasse Koronde.

Leaves opposite, rarely sub-opposite, short-petioled, ovate-oblong, entire, rather obtuse; texture hard, surfaces polished, the three nerves often uniting a little above the base, and the lateral two vanishing beyond the middle of the leaves; from four to six inches long, and from one and a half to three broad. *Petioles* about half an inch long, smooth, and channelled. *Panicles* terminal; the large *ramifications* opposite, expanding, the extreme ones three-flowered, all more or less four-sided, and smooth. *Flowers* numerous, small, greenish-white, smell rather offensive. *Bractes* minute, caducous. *Calyx* six-cleft; base entire, embracing the germ; *border* divided into six, oblong, slightly villous segments, the three exterior rather broader, all are permanent and from a *cupula*, or small cup in which the berry sits, as in the common oak. *Corol* no other than the last described body. *Filaments* nine, the six exterior inserted on the II. base of the segments of the calyx, and without glands, the other three have a conglobate gland 297 on each side, and alternate with the three short pedicelled, sagittate, *nectarial* bodies, inserted a little lower down. *Anthers* four-lobed, &c. as in the other species. *Germ* ovate, one-celled, containing one *ovula*, attached to the top of the cell. *Style* length of the stamina. *Stigma* three-lobed. *Berries* oblong-oval, smooth, succulent, when ripe, dark blackish purple, the size of a field-bean, one-celled, one-seeded. *Seed* conform to the berry. *Perisperm* none. *Embryo* inverse. *Cotyledons* oblong, fleshy. *Plumula* two-lobed. *Radicle* ovate, superior.

2. L. *malabathrica. Soland. Mss.*

Leaves oblong, three-nerved, with the lateral nerves distinct to the very apex. *Panicles* terminal.

Katou-karua. *Rheed. Mal.* 5. *t.* 53.

A native of the Malabar mountains.

3. L. *cassia. Willd.* 2. 477.

Leaves subopposite, lanceolar, triple nerved. *Panicles* axillary with simple, three-flowered ramifications. *Nectarial glands* sagittate. *Stigma* triangular.

Sans. Twuk-pu*tra*.

Tej-pat the Hindoo name of the leaves.

Carua. *Rheed. Mal.* 1. *t.* 57.

Cinnamomum perpetuo florens of *Burm. Zeyl.* 1. 28. is too broad in the leaf, and too ovate for this, and seems to me to agree better with my next species L. *multiflora*, which is also a native of Ceylon.

An elegant large tree, a native of the various mountains of the continent of India. The trees are now common in gardens about Calcutta, originally from the mountains of Tippera. Flowering time, in the gardens, the beginning of the warm season; the seed ripens in July. II. *Trunk* straight. *Bark* smooth, of a greenish ash-colour. *Branches* numerous, forming 298 an elegant, tall, oblong head. *Leaves* subopposite, drooping, short-petioled, lanceolar, triple nerved, smooth and polished on both sides; about five inches long, and one and a half broad. *Panicles* axillary, or terminal, on small axillary branchlets, as long as the leaves. *Ramifications* opposite, simple, each bearing three short-pedicelled, small, whitish flowers. *Bractes* minute, caducous. *Calyx* as in the genus. *Segments* villous. *Nectarial glands* sagittate, and yellow. *Filaments* nine, six in the exterior series, without glands; and three in the inner, with glands. *Stigma* clavate, three-lobed. *Berry* oval, the size of a black currant, smooth, succulent, when ripe black, one-celled. *Seed* conform to the berry. *Embryo* inverse, without perisperm.

This differs from all the other species hitherto described by me, not only in the narrowness of the leaves, but in the lateral nerves thereof issuing from the middle nerve considerably above the base. The panicles also differ greatly; for here the ramifications are simple, and bear three flowers; there they are compound, and umbelliferous. In both this, and *multiflora* (which is the species it comes nearest to,) the nectarial glands are sagittate, but there the stig-

* Sent to the Honourable the Court of Directors.

Page Carey Ed. ma is peltate, here three-lobed.

4. L. *multiflora. R.*

Leaves opposite, three-nerved, ovate-lanceolar, the nerves vanishing towards the top. *Panicles* terminal, and axillary, with compound umbelliferous ramifications. *Nectarial glands* sagittate. *Stigma* peltate.

Cinnamomum perpetuo florens. Burm. zeyl. p. 63. *t.* 28. appears to be this plant, and is the only figure known to me that I can well refer to.

II. 299 This small elegant tree, as far as I know, is only found in Ceylon, and approaches the true Cinnamon; yet I must deem them distinct species for the reason mentioned throughout the description, and in a note at the bottom.*

Leaves opposite, short-petioled, ovate, or ovate-lanceolate, entire, very smooth on both sides, three-nerved, with the lateral nerves vanishing towards the apex. *Stipules* none. *Panicles* from the exterior axils, and terminal, crowded with numerous, cross-armed ramifications, dividing into others, and finally ending in umbellets of small, whitish-yellow flowers. *Calyx* of six divisions, which are sublanceolate, nearly equal and very downy, particularly on the inside. *Nectarial glands*, the three that stand alternate with the three interior stamens are sagittate, and purple. *Stamens*, the three interior filaments have each a pair of large, flat, crenulate glands near the middle, as in L. *Cinnamomum*, &c. *Anthers* with four poleniferous pits. *Stigma* large, peltate.

5. L. *culitlaban. Willd.* 2. 478.

Arboreous. *Branches* appressed. *Leaves* opposite, ovate, lanceolate, triple-nerved, retrofracted. *Panicles* terminal, and axillary. *Pedicells* three-flowered. *Nectarial* scales sagittate.

Mal. Culit-lawan, Culi-lawan, or Cortex caryophyllaides. *Rumph. Amb.* 2. *t.* 14.

II. 300 About the year 1802, many plants of this tree were received into the Company's Botanic garden at Calcutta from Amboyna, and in the dry seasons of 1809-10 the only plant that remained alive blossomed. It is about twelve feet high, slender as the common Cypress, in consequence of the branches being short, erect, and pressed to the stem. The bark of the trunk, which is about as thick as a man's arm, is ash-coloured; of the round young shoots a shining deep green, from it the Malays obtain an essential oil by distillation; and Dr. Fleming informs me that he has seen various specimens of it from Bencoolen, and says it smelt like a mixture of sassafras and cloves. I suppose that its medical virtues agree with those of the essential oils of those substances. Murray says that the inhabitants of Amboyna esteem it an excellent remedy in a retention of urine, given in a dose of six drops twice a day.

Leaves for the most part perfectly opposite, short-petioled, refracted, broad-ovate-lanceolate, triple-nerved, of a hard texture, and with a polished, deep green surface, from three to five inches long, and from one to two broad. *Panicles* terminal and axillary, shorter than the leaves, brachiate, the ultimate divisions three-flowered. *Flowers* small, white, inodorous. *Bractes* oblong, or lanceolate, opposite at the divisions of the panicle. *Calyx* to near the base, six-parted, &c. as in the other species. *Stamina* also as in the other East Indian species. *Nectarial glands* with very exactly sagittate heads. *Germ* ovate, one-celled containing one seed, attached to the top of the cell. *Style* of a middling length. *Stigma* obscurely three-toothed.

6. L. *nitida. R.*

Leaves opposite, broad-lanceolar, obtuse, triple-nerved, glossy. *Panicles* axillary, and below the leaves, with simple, three-flowered, ramifications. Glands of the inner filaments pedicelled.

Cassia *Coolit manees Marsden's Sumatra, p.* 125.

II. 301 A native of Sumatra, from thence Dr. Charles Campbell sent plants in 1802, to the Botanic garden at Calcutta under the Malay name *Koolit manees*. After seven years the young trees blossomed in February, and ripened their seeds in May.

Trunk straight, in our young trees the bark is yet quite smooth, and of a greenish ash-colour. *Branches*, and *branchlets* spreading. *Leaves* opposite, short-petioled, broad-lanceolar, distinctly triple-nerved to near the apex, permanent, of a firm texture, polished, and very smooth on both sides, but paler coloured underneath; five or six inches long, and from one and a half to two broad; when young, coloured; when bruised they emit a pleasant spicy odour. *Petioles* short, and channelled. *Panicles* below the tender leaves of the young shoots, and also solitary in their axils, and shorter than them, composed of opposite, and alternate, three-flowered, diverging peduncles. *Flowers* small, pale yellow. *Segments* of the calyx, (corol. *Linn.*) oval and hairy on the inside. *Nectarial glands;* the inner three cordate-sagittate, on short pedicells. Those attached to the inner three filaments, are also supported on short pedicells, which issue from their filaments a little above their base. This circumstance alone, if constant, distinguishes it from all the other species of this genus which I have yet met with, for in all the rest they are sessile.

Germ conical, one-celled, with one seed, attached to the top of the cell. *Stigma* three-lobed. *Berry* obovate, the size of a field-bean, polished, and when ripe, of a deep dark green bordering on grey, one-celled. *Seed* solitary, conform to the berry. *Integuments* two, both thin, and of a dark, dull brown colour. *Perisperm* none. *Embryo* conform to the seed, inverse, pale green. *Plumula* conic, three-lobed. *Radicle* roundish, superior.

7. L. *recurvata. R.*

Shrubby. *Leaves* subopposite, ovate, long-pointed, with the two lateral nerves evanescent

* The remarkable, umbelliferous, extreme ramifications of the panicles in this species, readily distinguish it from others hitherto described by me. I must, at the same time say, that I think every attempt to find clear, correct, specific marks in the leaves alone, will prove fruitless

towards the apex. *Nectarial* glands with cordate heads. *Peduncles* axillary, three-flowered.

There are several trees of this species in Mr. Cox's garden at Russapugla near Calcutta, formerly Mr. Johnson's; the plants are said to have been originally from China. Flowering time the hot season.

Trunk short, with suberect, rigid *branches* forming a large, oblong, erect bush. *Bark* smooth, and more or less green, according to age. *Leaves* subopposite, short-petioled, ovate, tapering to a long narrow point, recurved, three-nerved, with the two lateral vanishing towards the apex, on both sides smooth. *Peduncles* axillary, or opposite, on the present years shoots below the leaves; solitary, three-flowered. *Corol, nectary, stamens,* and *pistil* as in L. *Dulcis.*

The leaves possess a considerable share of a sweetish aromatic taste; but are much weaker than those of *dulcis,* and the bark still more so.

8. L. *obtusifolia. R.*

Leaves opposite, three-nerved, lanceolar, obtuse. *Panicles* terminal, with an involucre of four large leaves, and a bud in the centre, smooth. *Nectarial glands* cordate-sagittate. *Berries* oval. Kinton is the vernacular name in Silhet, and Ramtejpat at Chittagong.

A large tree, a native of the mountainous countries immediately east of Bengal, where it blossoms in January and February, and the seed ripens in July and August. It has the habit of the Cinnamon tree, but grows to a much greater size, being as large as the mango tree. The timber is said to be very useful, and as it can be had of a large size, it is used for various purposes.

Branches opposite; the young ones smooth, and somewhat four-cornered. *Leaves* opposite, when they attend the panicles subquatern, short-petioled, lanceolar, obtuse, entire, completely three-nerved, of a very firm texture, smooth, of a deep, shining green on the upper surface, and glaucous underneath; from six to ten inches long, and from two to three and a half broad. *Panicles* many, round a smooth scaly bud, which forms the apex of the branchlet, and also from the axils of their subquatern leaves, long-peduncled, subdecussate; *ramifications* smooth, and tending to be four-cornered; ultimate divisions three-flowered. *Flowers* very numerous, small, greyish-yellow. *Bractes* caducous at an early period, clothed with greyish, sericeous pubescence. *Calyx* six-cleft, &c. as in the genus, somewhat sericeous. *Nectarial filaments* hairy, with large cordate-sagittate heads. *Stamina* as in the genus, the inner three filaments have their glands clavate, and hairy. *Germ* superior, ovate, one-celled, containing a single *ovula,* attached to the top of the cell. *Style* shorter than the stamina. *Stigma* large, three-angled. *Berries* oval, succulent, the size of a field bean, smooth; when ripe, black, one-celled, one-seeded, &c. as in the genus

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9. L. *dulcis. R.*

Leaves sub-opposite, three-nerved, lanceolate. *Panicles* terminal and axillary; nectarial glands with purple cordate heads.

This elegant, tall, slender, small tree, I have only found in an Armenian's garden near Calcutta, who informs me that he got the plants from China about seven years ago; they are in flower about the beginning of the hot season, in March and April, the seed ripens early in the rains.

Trunk straight, and high in proportion to its thickness; *bark* ash-coloured, and smooth. *Branches* elegantly scattered in all directions, with extremities often pendulous, forming a slender, oblong head. *Leaves* opposite, or nearly so, drooping, short-petioled, lanceolate, entire, rather obtuse, three-nerved, with the lateral ones vanishing above the middle, smooth, deep green on both sides; about four or five inches long, and from one to one and a half broad; when young coloured like those of the Cinnamon tree. *Panicles* terminal, or opposite near the extremities of last year's shoots, or the base of the present; when so, the coloured leafy shoot from the centre, gives to the whole the appearance of a large tufted panicle. *Bractes* minute, caducous. *Flowers* small, of a pale yellowish colour, on pretty long, slender, diverging pedicels. *Calyx* none. *Corol* as in L. *Cinnamomum. Nectarial glands* cordate, dark purple, on short, thick, yellow filaments. *Stamens* exactly as in L. *Cinnamomum. Germ* ovate. *Style* crooked, the length of the stamens. *Stigma* pretty large, and glandular.

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From the sweet aromatic taste, and smell of the leaves and bark of this pretty tree, I am inclined to think it is this which yields the thin, small, quilled cinnamon like Cassia, and Cassia buds carried from China to Europe and elsewhere.

It is readily distinguished from L. *cinnamomum* by its long narrow leaves in which the nerves vanish a little above the middle, and by its cordate nectarial glands. From *Laurus Cassia* it is readily distinguished by its leaves; there the nerves are triple, (that is they meet the main or middle one considerably above the base of the leaves) and continue distinct to near the apex, as in *Carua Rheed. Mal. vol.* 1. *f.* 57.

SECT. 2. *Leaves alternate.*

10. L. *camphorifera. Willd.* 2. 478.

Leaves alternate, ovate-lanceolate, taper-pointed, three-nerved. *Panicles* axillary, with alternate corymbiform ramifications. *Nectarial glands* clavate, hairy.

The trees from which my description, and drawing of this famous plant are taken, grow at Hottentos Holland near Cape Town, Cape of Good Hope.

They were brought to that place from Sumatra, or Java by Governor Vanderstell, in 1692-3, the trunk of these trees, now 1798, is short in proportion to their thickness, rather crooked, and from ten to twelve or even more feet in circumference. The whole tree has much

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Page Carey Ed. the appearance of a fine old oak. I saw about twenty of them, besides which many have been cut down for the wood, nor could I learn that any attempts had been made to procure *Camphire* from them; though the owner, Mynheer De Vos says, he has often observed minute whitish grains amongst the fibres of the wood, but knew not what they were, and paid no attention to them. Many young trees and plants are to be found in the neighbourhood. They all seem perfectly at home. M. De Vos would certainly find it worth his while to cut up into chips every refuse piece, and sublime, or distil it with water in an iron retort, covered with an earthen, or wooden head, in the cavity whereof hay or straw should be put to which the *Camphor* as it rises would adhere. See *Kæmp. Amoen. p.* 772. *Thunberg*, &c. authors who have written on the subject.

The *Leaves* are alternate, petioled, ovate, and oblong-lanceolate, smooth, entire, pointed, triple-nerved, the nerves less regularly disposed than in any of the other species, and vanishing about the middle of the leaf; they are from three to four inches long including the petiole, which is from a third to a fourth of the whole.

Stipules none. *Panicles* axillary, solitary, about as long as the leaves, and composed of small, alternate, corymbiform ramifications. *Flowers* numerous, all hermaphrodite that I have examined, small, of a pale greenish yellow. *Bractes* small, caducous. *Corol, nectarial*
II. *glands, stamina, pistil* and *berry* exactly as in L. *Cinnamomum*. See the description thereof.
306 The alternate leaves, and alternate ramifications of the panicles, immediately distinguish this species from all the others I have yet met with.

This is far removed from the famous camphor tree of Sumatra, which is a Shorea.

Laurus camphorifera. Kœmpf. Amoen. 770. *t.* 771.

Leaves alternate, oblong, ventricose, acuminate, sub-triple-nerved, with glands in their axils *Racemes* axillary, nectarial glands conglobate.

This slow growing, handsome tree, is a native of the Malay Islands, and was introduced into the Botanic garden at Calcutta in 1802; now 1810, the largest of many individuals is only eight or ten feet high, clothed with spreading branches down to the ground. They now begin to blossom in April.

Trunk in our young trees short, variously bent, dividing into many, far expanding, ramous branches. *Bark* of the oldest woody parts rather scabrous; of the *young shoots* smooth, polished, glaucous-green. *Leaves* alternate, no tendency toward being opposite, petioled, of an ovate, oblong-ventricose shape, entire, waved, tapering at the apex to a long sharp point, while young, of a soft, when old, of a firm, or rather hard texture, of a polished deep green above, glaucous underneath, somewhat triple-nerved, and in the axils of the nerves little glands, as mentioned by the accurate Kœmpfer; from two to four inches long. In this species they are particularly permanent, and what is uncommon in these countries, scaly conical buds are formed. The leaves, bark, and succulent parts smell strongly of camphor when bruised. *Petioles* slender, channelled, scarcely an inch long. *Racemes* axillary, short, and as yet simple, and bearing but very few, subopposite, small whitish, pedicelled flowers. *Bractes* minute, and caducous. *Calyx* and *Stamina* as in the genus. *Nectarial glands*
II. three which (as in all the other species of *Laurus* described by me,) are alternate with the
307 inner three filaments, sessile, conglobate, and yellow. The other three pairs are small, and attached laterally to the very base of the inner three filaments. *Stamina* as in the other species. *Germ* superior, ovate, one-celled, containing one seed, attached to the top of the cell. *Style* about as long as the stamina. *Stigma* three-lobed. *Berry* sub-globular, size and colour of a black currant. *Seed* solitary. *Embryo* inverse, without perisperm, &c. as in the genus.

11. L. *glaucescens. R.*

Leaves alternate, narrow-lanceolate, triple-nerved. *Flowers* in lateral fascicles.

A native of the northern Circar mountains, behind Rajamundree.

Laurus sylvestris. B. H.

Arboreous. *Leaves* alternate, lanceolar, acuminate, one-nerved. *Panicles* terminal, tomentose (with a tomentose scaly bud in the centre.) *Nectarial glands*, broad-cordate-sagittate. *Berries* spherical.

Orook, the vernacular name in Silhet, where it is indigenous, growing to the size of the mango tree. It flowers in February, and the seed ripens in April and May. The timber of this tree is made use of by the natives for various economical purposes.

Leaves alternate, short-petioled, broad-lanceolar, and though acuminate, tapering most toward the base, entire, smooth on both sides, but glaucous underneath; (no tendency to the tri or triple-nerve habit,) from three to six inches long, and two broad. *Stipules* none. *Panicles* terminal, several, round a terminal scaly tomentose bud, the length of the leaves, having every part amply clothed with soft, light-brown pubescence, and composed of alternate, dichotomous branches; each division three-flowered, and one in the fork. *Bractes* small,
II. villous, caducous. *Calyx* six-cleft. *Segments* oblong, villous on both sides, permanent. *Nec-*
308 *tarial glands* with short filaments, and broad-sagittate-cordate heads. *Stamina* as in the genus, viz. six forming the exterior series, with the side of the anthers containing the four poleniferous pits facing the stigma; the inner three with their anthers reversed; (i. e. the four poleniferous pits facing outward.) *Germ* ovate, one-celled, containing one *ovula* attached to the top of the cell. *Style* shorter than the stamina. *Stigma* small, and obscurely three-toothed. *Berries* round, &c. in size and appearance much like a large black currant. *Seed* solitary, round, &c. as in the genus.

12. L. *porrecta. R.*

Leaves alternate, oblong, veined, glaucous underneath. *Panicles* lateral. *Nectarial glands*

sagittate. *Stigma* three-toothed. *Berries* round. Page Carey Ed.

Cayoo-gaddees. *Marsden's Sumatra, p.* 129.

A native of Sumatra. From thence Dr. Charles Campbell sent plants to the Botanic garden at Calcutta, where after seven years they blossomed during the cool months of December and January, and ripened their berries in May. *Roots*, the ligneous parts very much like sassafras, and possessing the same pleasant, sweetish, aromatic taste and fragrance. *Trunk* straight to the top of the tree, and clothed with numerous branches to the base; the lower ones reclinate, with their extremities ascending, the superior ones expanding. *Bark* on the trunk, and old branches, of a brownish ash-colour, and somewhat scabrous; on the young ones smooth and green; height of the tree, in seven years, about twenty feet. *Leaves* alternate, petioled, veined, * permanent, oblong, entire, generally acuminate, firm, both sides smooth, the upper polished, the under glaucous, from three to six inches long, and from two to three II. broad. *Petioles* about an inch long, channelled, smooth and slender. *Panicles* lateral, scattered 309 round the base of the young shoots, below their tender foliage, solitary, long-peduncled, expanding, small, composed of a few, nearly diverging branchlets. *Flowers* numerous, pedicelled, small, pale yellow. *Bractes* few, minute caducous. *Calyx* with border divided into six alternately rather smaller, oblong, obtuse, expanding segments, which are somewhat hairy on the inside. *Nectarial glands* three, with sagittate yellow heads, alternate, with the inner three stamina, and three pair on their filaments, immediately below the anthers. *Filaments* nine; six in the exterior series, inserted on the base of the divisions of the calyx, and three on the inner inserted with the sagittate nectarial glands, round the mouth of its tube. *Anthers* oval, with four poliniferous, lidded pits, on the inside of the exterior series, and four on the inside of the inner. *Germ* superior, ovate, one-celled, with one *seed* attached to the top of the cell. *Style* short. *Stigma* three-toothed. *Berry* globular, the size of a small black currant, smooth, when ripe succulent, and of a dark purple colour, the pulp smells exactly like the fresh skin of a green orange, one-celled. *Seed* solitary, round. *Integuments* two; the *exterior* one rather hard, and dark brown; the *interior* one membranaceous, and adhering to the cotyledons. *Perisperm* none. *Embryo* inverse. *Cotyledons* semispherical. *Plumula* two, lobate. *Radicle* ovate, superior.

13. L. *lanceolaria. R.*

Arboreous, every part glossy. *Leaves* alternate, lanceolar, acuminate, one-nerved. *Panicles* axillary, and round the base of the young shoots. *Berries* oblong.

Sundhigool, the vernacular name in Silhet where it is indigenous. It grows to be a middling sized tree, the wood of which the natives convert into various useful purposes.

Flowering time April; the fruit ripens in the rains. II.

Branchlets crowded, or subverticillated, smooth, clouded. *Leaves* alternate, petioled, 310 lanceolar, tapering equally at each end, acuminate, one-nerved, entire, shining; from four to six inches long, and from one to one and a half broad. *Panicles* axillary, and round the base of the young shoots, from the axils of the scales which formed the bud of the shoot, and also from the axils of the leaves of the shoots, long peduncled, small, smooth. *Bractes*, the inferior ones like the leaves, but small, those of the subdivisions linear. *Flowers* numerous, small, pale yellow. *Calyx* six-parted. *Segments* oval, smooth. *Stamina* as in the genus. *Nectarial glands* broad, cordate-sagittate, their pedicles hairy on the inside. *Germ* ovate, one-celled, containing one *ovula* attached to the top of the cell. *Style* cylindric. *Stigma* three-lobed. *Berries* oblong, succulent, smooth, black, one-celled, &c. as in the genus.

14. L. *villosa. R.*

Arboreous. *Leaves* alternate, petioled, lanceolar, one-nerved. *Panicles* axillary and round the base of the young downy shoots, villous. *Berries* spherical.

A large tree, a native of the forests of Chittagong, where it blossoms in January.

Trunk in full grown trees in their native soil, from four to five feet in circumference and covered with scabrous, dark brown *bark*; young tender *shoots* tomentose, but becoming smooth by the second year. *Leaves* alternate, petioled, lanceolar, entire, one-nerved, obtuse-pointed, when they first begin to expand soft and very downy, like the twigs that bear them, but soon becoming hard and somewhat glossy; from four to six inches long, and from one and a half to two broad. *Panicles* axillary, and round the base of the young shoots, copious, the length of the leaves, very ramous, and very downy. *Bractes* small, downy. *Calyx, stamina* and II. *germ* as in the genus, permanent. *Nectarial glands* pedicelled, triangularly sagittate. *Berries* 311 spherical, of the size and appearance of a black currant. *Seeds* and *Embryo* as in the genus.

15. L. *bilocularis. R.*

Arboreous, with a straight trunk, and many, far-extended branches. *Leaves* opposite, and alternate, broad lanceolar, veined. *Racemes* solitary under the leaves, or axillary. *Filaments* without glands. *Nectaries* nine. *Anthers* bilocular. *Berries* oblong, glaucous.

A native of the country about Tippera, from thence Stephen Harris, Esq. sent plants to the Botanic garden at Calcutta in 1797, where at the age of ten years, they blossomed in March, and the fruit ripened in June.

Trunk straight. In trees thirteen years old, two feet in circumference four feet from the root, covered with smooth, ash-coloured bark. *Branches* very numerous, and spreading horizontally to a great extent, forming a large, uncommonly dense, broad-ovate shady head; *young shoots* round and smooth, green on the side most remote from the sun, and purplish on the other. *Leaves* opposite and alternate, petioled, veined, broad-lanceolar, often unequal at the base, entire, obtuse-pointed, smooth on both sides; about six inches long and two broad.

* The *trinerve* or *triple-nerve* habit, so general amongst our East India *Lauri* is not found in t species.

Page Carey Ed. deciduous during the cold season, and appearing with the flowers in March. *Petioles* one-sixth or one-eighth the length of the leaves, round, smooth. *Pedunules* axillary and from the base of the young shoots below the tender leaves, solitary, scarcely so long as the petioles, round, a little villous, bearing a few, viz. from six to twelve, small pedicelled pretty yellow flowers, in form of a raceme. *Bractes* one under the insertion of each pedicel, ovate, caducous. *Calyx* of six oblong, villous, expanding segments, &c. as in all the other species examined
II. by me. *Corol* none. *Filaments* nine, six in the outer series and three in the inner, all with-
312 out glands. *Anthers* oblong-ovate, bilocular, that is with only one oblong, polleniferous pit on each side, as in *Cassyta*, this species differing from all I have yet met with, the rest having two pits on each side. *Nectarial glands* nine, all pedicelled ; six alternate, with the six exterior stamina, with larger, and more rounded heads, and three alternate with the inner three, and of a cordate-sagittate shape, all yellow and fleshy. *Germ* ovate, one-celled, with one seed attached to the top of the cell. *Style* straight, length of the filaments. *Stigma* somewhat three-cornered. *Berries* oblong, as thick as the largest olive and considerably longer, being about two inches long, and one in diameter, smooth, when ripe a deep dark purple, covered with much whitish-grey bloom which easily rubs off. *Pulp* pale yellow. *Seed* solitary, conform to the berry. *Integument* somewhat nuciform, and lined with a thin membrane. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed. *Plumule* of two minute lobes. *Radicle* roundish, superior.

ANACARDIUM. Schreb. gen. n. 1582.

Calyx five-parted. *Petals* five, reflexed. *Germ* superior, one-celled, one-seeded, attachment lateral. *Nut* reniform, resting on a fleshy receptacle. *Embryo* erect, without perisperm.

1. A. *occidentale. Willd.* 2. 486.
Kapa mava. *Rheed. Mal.* 3. *t.* 54.
Cassuvium. *Rumph. Amb.* 1. *t.* 69.
Hind. and *Beng.* Hijulee-budam.
Acajuba occidentalis, *Gært. sem.* 1. 192. *t.* 40. *f.* 2.

A tree common in the East and West Indies. In the former it is found in the vicinity
II. of the sea only, where the soil is almost perfect sand. Flowering time March and April.
313 *Trunk* short, thick and very crooked. *Bark* considerably rough, and in old trees deeply cracked. *Branches* numerous, spreading in every direction to a great extent. *Young shoots* round, and smooth. *Leaves* alternate, rather short, petioled, obovate, with a rounded or emarginate apex ; smooth on both sides and of a hard texture, from four to eight inches long. *Panicles* terminal, bearing both barren and fertile hermaphrodite flowers intimately intermixed, small, and of the same size and external appearance. There may be trees which produce barren flowers only. *Bractes* gibbous, lanceolate. *Calyx* inferior, five-cleft nearly to the base ; *dicisions* oblong, conic, acute, and pretty smooth. *Petals* five, linear-lanceolate, revolute, of a pale yellow colour, with longitudinal pink stripes. *Filaments* generally nine, united at the base into a ring round the germ, one of them particularly in the sterile flowers, more than double the length of the others. *Anthers*, they appear to be all fertile, that of the major filament larger. *Germ* in the barren flowers minute, with a very short style, in the fertile flowers obliquely obcordate ; one-celled, with one reniform seed attached to the side of its cell. *Style* long, becoming convolute, as if to bring the simple *stigma* into contact with the large anther of the long filament. *Fruit* as described and figured, by *Gært. vol.* 1. 192. *t.* 40.

2. A. *dubium. R.*

A native of Sumatra, and said to be a large and beautiful tree.

Branchlets round, and smooth. *Leaves* alternate, short-petioled, lanceolate, entire, smooth, from four to six inches long, and about two broad. *Stipules* none. *Panicles* terminal, thin, pretty large, and composed of a few, alternate, compound, and simple corymbiferous ramifications.
II. *Flowers* numerous and small. *Calyx* inferior, one-leaved, bifid. *Segments* rounded. *Petals*
314 four, five, or six, (five most common,) inserted round the middle of the clavate receptacle which elevates them, the stamina and pistil above the calyx linear-lanceolar. *Filaments* four, five, or six, corresponding with the number of petals, inserted on the receptacle below the germ, rather shorter than the corol. *Anthers* oblong. *Germ* obliquely obcordate, one-celled, containing one ovula attached to the upper part of the cell a little to one side, and immediately under the insertion of the long curved *style*. *Stigma* simple.

CASSYTA.

Calyx three-leaved. *Corol* three-petalled. *Filaments* petaliform ; the inner three with glands at the base. *Nectarial glands* three, alternate with the appendaged filaments. *Drupe* inferior, one-seeded.

C. *filiformis. Willd.* 2. 487.
Filiform, lax, leafless.
Acatsja valli. *Rheed. Mal.* 7. *t.* 44.
Sans. Akashavuli.
Teling. Paunch tiga.

A thread-like leafless parasitic plant, found growing on, and twisting round the branches of trees, &c. in almost every part of the Coast and in Bengal.

Spikes lateral, ascending. *Flowers* small, white, rather remote. *Bractes* three-fold, em-

bracing the fructification, like a calyx, and only a little less than it. *Calyx* three-leaved; *leaflets* very small, round, permanent. *Corol; petals* three, oblong, many times larger than the calyx. *Nectary* (I call what have been termed filaments such) composed of nine, *stameniferous* leaflets and nine glands; the leaflets stand in three *series*, those of the *exterior series* are club-bed, lying immediately over the petals, and rather shorter than they are; on the inside near the apex are two oval pits, where the stamens are lodged till they are ripe, the second and largest *series* oblong, standing alternate with the petals, length of the *exterior series*, and having their stameniferous pits the same; *inner* or third series the smallest, each augmented with two yellow glands at the sides of the base, swelling out over these glands, and then tapering to an obtuse point; the stameniferous pits are here on the outside. The three remaining glands are cordate, pointed, standing alternate with the inner series, embracing immediately the germ. *Filaments* nine pair, most minute, inserted into the upper margins of the pits of the nine leaflets of the nectary. *Anthers* small, oval, when ripe they spring with a jerk from their enclosures and stand erect, or spreading upon their little filaments.

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Style short. *Stigma* entire. *Nut* round, covered by the increased receptacle.

ENNEANDRIA HEXAGYNIA.

BUTOMUS. Schreb. gen. N. 693.

Calyx none. *Petals* six. *Capsules* six, many-seeded.

B. *lanceolatus. R.*

Leaves radical, long-petioled, lanceolate. Scape as long as the leaves, bearing from six to twelve long pedicelled flowers in an upright umbel.

Found by Dr. Buchanan, in the Eastern parts of Bengal.

CLASS X.

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DECANDRIA MONOGYNIA.

SOPHORA. Schreb. gen. N. 694.

Calyx gibbous, five-toothed. *Corol* papilionaceous, wings length of the vexillum. *Legume* necklace-shaped.

1. S. *tomentosa. Willd.* 2. 500.

Shrubby. *Leaves* pinnate; *leaflets* about eight pair, between alternate and opposite, ovate, obtuse, hoary underneath. *Legume* necklace-shaped.

This large shrub, or small tree, is so far as I can learn, a native of Ceylon. From thence it was introduced into the Botanic garden at Calcutta in 1798, by Dr. A. Berry. Flowering time in Bengal the rainy season.

Trunk erect, with expanding branches. *Bark* of the old woody parts somewhat scabrous, of the young shoots hairy. *Leaves* alternate, pinnate, from six to ten inches long. *Leaflets* about eight pair, short-petioled, neither alternate nor opposite but between the two; ovate, obtuse, entire, of a firm texture, smooth above and hoary underneath; from an inch to an inch and a half long, and about one broad. *Petioles* and *Petiolets* round, and villous. *Stipules* none. *Racemes* terminal. *Flowers* numerous, generally single, bright yellow, fragrant. *Bractes* solitary, one-flowered, caducous. *Calyx* villous, of a short urceolate shape, with the margin slightly five-toothed, and incurved. *Corol* papilionaceous. *Legume* necklace-shaped, villous, composed of about five or six nearly round protuberances, with a single, round, brown, smooth seed in each.

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PODALYRIA. Lamark.

Calyx five-toothed. *Corol* papilionaceous. *Legume* ventricose, few, or many-seeded.

P. *bracteata. R.*

Shrubby. *Leaves* simple, oval. *Peduncles* axillary, once or twice bifid; ultimate divisions flowered, with a pair of large, opposite, roundish, many-nerved bractes, hiding the calyx, and a similar pair at the forks of the peduncles.

Gopoori, the vernacular name in the Silhet district, where it is found indigenous in the forests, growing to the size of a large bushy shrub. Flowering in May and June, and the seeds ripening in December and January.

Tender shoots columnar, and clothed with a few thinly scattered hairs. *Leaves* alternate, bifarious, petioled, oval, entire, obtuse, smooth, and beautifully reticulated with slender veins; from three to six inches long, and from two to four broad. *Petioles* from half an inch, to an inch and a half long, a little hairy. *Stipules* ovate, many-nerved. *Peduncles* axillary, solitary, once or twice bifid, each ultimate division, one-flowered. *Bractes* in pairs at the divisions of the peduncles, one pair the largest, embracing each flower; all round, or oval, and many-nerved. *Flowers* large, white, perfectly papilionaceous. *Calyx* bowl-shaped, hairy on the outside. *Mouth* unequally five-toothed, caducous. *Banner* very broad, deeply emarginate, short-clawed. *Wings* falcate, obtuse, five-clawed, the length of the banner, *keel* two-petalled, their lower margins united, of the length and shape of the wings. *Filaments* ten, distinct to their

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insertion into the receptacle round the base of the germ, subulate, smooth, nearly as long as the pistillum, ascending in a gentle curve. *Anthers* ovate, oblong, erect. *Germ* lanceolate, smooth, one-celled, containing three ovula attached to the upper margin. *Style* subulate. *Stigma* acute. *Legumes* obliquely oblong, tapering equally at each end, with the apex acuminate, and somewhat recurved, one-celled, two-valved, smooth, on the outside dark brown, within pretty and whitish, from three to four inches long and one and a half broad. *Seeds* two, or three, large, and very unequal, of a dark brown colour. *Perisperm* none. *Embryo* as in other *Leguminosæ*.

BAUHINIA.

Calyx a spathaceous border or tubular base. *Corol* irregular, five-petalled, expanding. *Anthers* incumbent, bursting longitudinally on their sides.

SECT. I. *Trees or Shrubs.*

1. B. *candida. Willd.* 2. 510.

Arboreous. *Leaves* roundish, downy underneath. *Lobes* obtuse. *Panicles* terminal. *Segments* five, all fertile. *Legume* linear.

Sans. Kuvidara, also Yooga-putra, double-leaved.

Hind Kana-raja.

A small handsome tree. I have only found it in gardens, where it flowers about the beginning of the hot season.

Leaves alternate, petioled, nearly bifarious suborbicular, two-lobed, from nine to eleven-nerved, the middle one ending in a villous bristle between the lobes, below downy; *lobes* oval, obtuse, or very obtusely-pointed; the whole leaf is from three to five inches each way. *Racemes* axillary, and terminal, those of the axils small and simple, the terminal ones large, compound, or panicled. *Flowers* numerous, white, large, delightfully fragrant. *Calyx* spathiform, leathery, not gaping at the base, splitting longitudinally on the under side; *apex* minutely five-toothed. *Filaments* five, ascending, the uppermost smallest. *Anthers* linear, incumbent; there are no sterile filaments in this species. *Germ* long-pedicelled. *Style* short, ascending. *Legume* linear, compressed smooth, many-seeded.

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2. B. *variegata. Willd.* 2.

Arboreous. *Leaves* smooth, subrotund with obtuse lobes. *Racemes* terminal and axillary. *Petals* broad-cuneiform, with waved margins. *Stamens* five, all fertile. *Legume* linear.

Chovanna mandaru. *Rheed. Mal.* 1. *p.* 57. *t.* 32.

Sans. Kuvidara.

Beng. Ructa-kanchun.

It is one of the most stately of the genus, growing to be a tree of considerable size; I have only found it in gardens; where it is indigenous I cannot say. Flowering time the month of February and March, the seed ripens in April and May.

Trunk tolerably erect, often as thick as a man's body. *Bark* dark ash-coloured and pretty smooth. *Branches* numerous, spreading in every direction, with smooth ash-coloured bark. *Leaves* subifarious, petioled, suborbicular, two-lobed; *lobes* obtuse, smooth above, somewhat villous underneath, from two to three inches each way. *Racemes* terminal, few-flowered. *Peduncles* clavate, round, villous. *Bractes* small, caducous. *Flowers* large, of a lively reddish purple. *Calyx* spathiform. *Petals* unilateral, pairs equal, and oblong, with somewhat curled margins; the upper one is broader, more deeply coloured, and with a longer channelled claw. *Stamina* five, all fertile, sometimes there are the minute rudiments of from one to five abortive filaments between them. *Legume* straight, linear, compressed, acuminate, pedicelled. *Seeds* from six to twelve, approximate, or often with the anterior edge of one resting over the posterior edge of its neighbour.

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This tree can only be said to differ from B. *candida*, in the colour of the flowers; had I met with this first, I should certainly have considered the other as a variety only.

3. B. *purpurea. Willd.* 2. 511.

Arboreous. *Leaves* smooth; *lobes* obtuse. *Filaments* ten, of which three or four are large and fertile. *Panicles* terminal. *Legumes* linear.

Chovanna-mandaru. *Rheed. Mal.* 1. *t.* 33.

Hind. Sona.

Beng. Deva-kanchun.

This I have not only found in gardens, but also wild on the mountains, where it grows to be a large tree.

Leaves alternate, petioled, nearly bifarious, smooth on both sides, from nine to eleven-nerved; the middle one ending between the lobes in a bristle; lobes oblong, obtuse, the whole from five to six inches long, and from four to five broad. *Panicles* terminal, ascending, composed of racemes, similar to, though larger than those of B. *candida*. *Bractes*, one embracing the insertion of the pedicel, and two pressing the calyx laterally. *Flowers* numerous, of a deep rose colour, very large. *Calyx* generally splits into two; *divisions* reflexed, the lower one is generally emarginate, and the upper one three-toothed. *Petals* lanceolate, waved. *Stamens* three or four, large with fertile anthers and six or seven small sterile filaments.

4. B. *triandra. R.*

Arboreous. *Leaves* smooth, subrotund, with lobes obtuse. *Racemes* terminal and axillary. *Petals* cuneiform, obtuse, long-clawed, margins waved, and curled. *Fertile stamina* three.

Legume linear, many-seeded. Page Carey Ed. II. 321

A native of Bengal. In the Botanic garden at Calcutta, it blossoms in October and November, the seed ripens in March.

Trunk straight, and of considerable size. *Branches* few, with smooth brown *bark*. *Leaves* alternate, petioled, sub-orbicular, two-lobed, having the *lobes* obtuse, entire, and smooth on both sides, about three inches long and four broad, the whole leaf being nearly the same. *Petioles* round, smooth, swelled at each end, length about one-third of the leaves. *Racemes* terminal or axillary, rarely opposite to the leaves. *Calyx* spathiform, &c. as in the other species. *Petioles* cuneiform, obtuse, with the margins waved and curled, three of them forming as it were an upper, and the other two the under lip of the corol. *Filaments* ten, of which three only are of the length of the pistil, and bear fertile anthers, the other seven very small and without the least vestige of an anther. *Legume* somewhat sickle-shaped, linear, smooth, from six to twelve inches long. *Seeds* remote, flat, round, from eight to sixteen in each legume.

This when in flowers, is one of the most beautiful species of Bauhinia I have yet met with, and as it blossoms when so low as three feet, and when not more than one year old, is particularly well adapted for the conservatory. It comes nearest to *purpurea* in the parts of fructification.

5. B. *malabarica. R.*

Arboreous. *Leaves* transversely broad, oval, smooth, nine-nerved, slightly two-lobed; *lobes* rounded. *Racemes* axillary, corymbiform, sessile; *calyx* and *corol* regular; *stamina* ten, all fertile.

A pretty large tree, a native of Malabar, in the Botanic garden at Calcutta, young trees four or five years old from the seed, are about twenty feet high, their stems about as thick as a man's thigh; *coma* very ramous, with its numerous, smooth, slender, flexuose branchlets, drooping. It begins to blossom in October and November. This very distinct species is remarkable for the regularity of its five-parted calyx, and equally disposed, equal petals.

6. B. *retusa. R.* II. 322

Arboreous. *Leaves* roundish, reniform, from two-lobed to scarcely emarginate. *Panicles* terminal. *Petals* roundish. *Stamens* three, all fertile. *Legume* oblong, from five to six-seeded.

I found this species in the Company's Botanic garden at Calcutta, but could never learn from whence it was brought. The trees are about twenty years old. Flowering time September; the seed ripens in March.

Trunk short and thick, but rarely straight. *Branches* spreading, with long, slender, waving, pendulous branchlets. *Bark* pretty smooth, rust coloured. *Leaves* bifarious, alternate petioled, round-reniform; from two lobed, to slightly emarginate, with a bristle in the notch, from seven to eleven-nerved, smooth on both sides, dimensions from three to six inches each way. *Panicles* terminal, and axillary, composed of many corymbiform racemes; the ramifications a little villous. *Flowers* numerous, small, pale yellow, beautifully marked with numerous, small, purple spots. *Filaments* three, from the under side, nearly as long as the pistil, ascending, they are all fertile. On the upper side of the large woolly receptacle into which these and the pistil are inserted, are two large, yellow, bristle-pointed, smooth glands, with smaller brownish ones, intermixed; some, or all of these have also a little bristle issuing from them. *Pistillum* when the flowers first expand, and for sometime afterwards recurved, as if to place the *stigma* below the anthers; afterwards it becomes incurved like the stamens, and in that situation the *stigma* is higher than the anther. *Legume* linear-oblong, with the apex rounded, flat, smooth, about six inches long, and two broad. *Seed* from four to eight in the legume, obovate, much compressed, smooth and of a dark brown colour.

From wounds made in the bark a brownish mild gum, like that of the cherry tree, is produced.

7. B. *parviflora. Willd.* 2. 509. II. 323

Arboreous. *Branchlets* drooping. *Leaves* subreniform, deeply two-lobed; *lobes* obtuse. *Racemes* solitary. *Stamens* ten, all fertile. *Legume* linear, ligneous, many-seeded.

Sans. Vuna-raja.

Tam. Areka-marum.

Teling. Arro.

A small, uncommonly crooked bushy tree; a native of most forests on the coast of Coromandel. *Bark* dark and scabrous.

Leaves alternate, petioled, two-lobed, somewhat downy; *lobes* oblong, rounded at both ends; size various, the whole leaf generally about two inches broad, and not quite so long. *Petioles* round, downy. *Racemes* simple, terminal, or leaf-opposed. *Flowers* scattered, pretty large, yellow. *Calyx* spathiform, bursting on the under side, reflected, not gaping at the base. *Petals* and *stamens* ascending. *Anthers* fertile on all the ten filaments. *Legume* scimitar-shaped, very hard, not opening, interrupted. *Seeds* from ten to twenty, oval, smooth, shining, brown. Matchlock men make their matches of the bark of this tree; it burns long, and slowly, without the help of saltpetre or any other combustible. To prepare the bark it is boiled, dried, and beat. Ropes are also made of the inner rind, which is fibrous, strong and durable.

8. B. *tomentosa. Willd.* 2. 511.

Shrubby. *Leaves* roundish, deeply two-lobed, villous underneath. *Stipules* setaceous. *Peduncles* leaf-opposed, two-flowered. *Petals* oval. *Stamina* ten, all fertile. *Legume* lanceolate, villous.

Canschena-pou. *Rheed. Mal.* 1. *t.* 35.

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A native of Malabar, Coromandel mountains, &c. In the Botanic garden at Calcutta, it is in blossom most part of the year.

Trunk straight. *Branches* numerous, forming a close, handsome, large shrub. *Bark* ash-coloured; *young shoots* villous; the general height about ten feet, I mean of large plants. *Leaves* alternate, bifarious, petioled, roundish, deeply two-lobed, with a minute bristle between; *lobes* roundish, villous underneath. *Stipules* filiform, villous. *Peduncles* solitary, nearly opposite to the leaves, two-cleft, two-flowered. *Flowers* large, of a pale sulphur colour, drooping. *Bractes* three on the outside of the base of each pedicel. *Petals* oval, the upper one smaller, and in some plants marked on the inside, with an oblong deep purple spot. *Filaments* ten, ascending, the length of the pistillum. *Anthers* ten, all fertile. *Legume* lanceolate, villous, from five to six-seeded.

9. B. *acuminata. Willd.* 2. 511.

Shrubby. *Leaves* with lobes somewhat pointed. *Racemes* laterifolius, and terminal. *Stamens* ten, alternate by shorter. *Legumes* lanceolate.

Velutta-mandaru. *Rheed. Mal.* 1. *p.* 61. *t.* 34.

Beng. Canchun.

Hind. Cuchunar.

It is a small, ramous tree, or large shrub; whole height from eight to ten feet. It is in flower most part of the year.

Trunk scarcely any, but many large branches spread in every direction; *bark* greyish brown. *Leaves* alternate, bifarious, petioled; two-lobed, nine-nerved, the middle nerve ends in a short bristle between the lobes; smooth above, downy underneath; *lobes* oblong, somewhat pointed; from two to four inches long. *Petioles* channelled, swelled, and jointed at the base, downy, one inch long. *Stipules* half-lanced, very acute. *Flowers* racemed, large, pure white, inodorous. *Racemes* solitary, laterifolious, or terminal, short, few-flowered. *Bractes* II. a small pointed one below each pedicel, with two or more scattered among the pedicels. 325 *Calyx* above, tapering to a long, fine point. *Corol* regular; *petals* expanding, oblong, concave, obtuse. *Filaments* ten, ascending, five are larger, more spreading than and alternate with the five shorter ones. *Anthers* equal. *Legume* obliquely linear-lanceolate; upper margin three-keeled. *Seeds* from eight to twelve.

Note. The pistillum is often minute, and abortive. This species differs from *candida* in being rarely more than a shrub; in having the lobes of the leaves pointed, and inodorous. *Flowers* with ten fertile stamens. It is a very specious plant, well deserving a place in the gardens of the curious.

SECT. II. *Scandent.*

10. B. *racemosa. Vahl. symbol.* 3. *p.* 56. *t.* 62. *Willd.* 2. 509.

Scandent, and of immense extent. Tendrils opposite. *Leaves* subrotund; *lobes* obtuse, downy. *Racemes* corymbiform, terminal. *Stamina* five, three of them fertile. *Legume* linear, ligneous, very downy.

Hind. Mahwal.

Nap. Boila.

Teling. Adda.

The largest and most extensive creeper I have seen. It is a native of the mountainous parts all over India, where it runs over the highest trees.

Trunk often as thick as a child's waist when only ten years old. *Bark* brown and rough. *Branches* very extensive, I may say from one to three hundred feet; *young shoots* covered with remarkably soft down. *Leaves* remarkably large, alternate, petioled, two-lobed; *lobes* II. rounded at both ends, downy with a middle nerve, ending in a soft bristle between the lobes; 326 size often a foot each way. *Petioles* round, downy. *Tendrils* opposite below the leaves, woody, very strong, simple. *Racemes* terminal corymbiform. *Peduncles* round, downy, not very long, as the flowers grow near each other. *Pedicels* about two inches long, thickened near the apex, jointed, and have there two small lanceolate bractes; besides a downy, narrow-lanceolate one below each pedicel. *Flowers* pretty large, when they first open white, but gradually becoming yellow. *Calyx* spathiform, on a tubular base. *Corol*, the superior petals larger, the inferior more distant. *Filaments* on the upper side of the germ three, nearly as long as the petals, ascending, bearing oblong, incumbent anthers; on the under side two or three very small, and without anthers. *Germ* oblong, sessile, downy. *Style* subulate, rather shorter than the filaments. *Stigma* headed. *Legume* pendulous, about twelve or eighteen inches long, and from two and a half to three broad, compressed, woody, covered with much, dark brown, soft velvet-like down. *Seeds* from eight to twelve, orbicular, flat, smooth, brown, about an inch in diameter, and one-sixth of an inch thick. They are eaten raw, when ripe, the taste is like that of *Cashew-nuts.*

The leaves are employed to line baskets, and various other sorts of packages by the hill people, where the plant grows for which they are well adapted not only on account of their great size, but also on account of their being remarkably firm, tough, and durable.

11. B. *scandens. Willd.* 2. 58.

Scandent. *Tendrils* opposite. *Leaves* round cordate, apex two-lobed. *Racemes* terminal, simple, or ramous. *Flowers* triandrous. *Legumes* linear, from four to five-seeded.

Folium linguæ. *Rumph. Amb.* 5. *p.* 1. *t.* 1.

II. Gunda-gilla the vernacular name in Silhet, where it is indigenous in the forests of that 327 province, running up, and over trees of the first magnitude. Flowering in April and the seed

ripening in October.

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Branchlets very long, flexuose, sending forth from each knee, a small tendril-bearing floriferous twig. The tendrils are generally opposite, slender, flattened and simple. *Leaves* alternate, long-petioled, round-cordate, apex divided into two lobes, by an open gape; some few are found perfectly entire, smooth on both sides, general size from three to five inches each way. *Racemes* terminal, sometimes ramous, but far more frequently simple, covered with much brown sericeous pubescence. *Flowers* rather small for a *Bauhinia*, alternate, solitary, long pedicelled. *Bractes* acuminate, one under each pedicel, sericeous. *Calyx* clavate, sericeous, having the *mouth* divided into five, small, rounded segments. *Petals* five, nearly equal, orbicular, short-clawed, densely clothed with much soft, ferruginous grey-down. *Filaments* three, ascending, longer than the pistillum. *Anthers* incumbent. *Germ* short-pedicelled, linear, densely clothed with ferruginous down, one-celled; *ovula* from five to six. *Style* rather short. *Stigma* capitate. *Legume* linear-oblong, dark brown, somewhat villous, from four to six inches long, and two broad. *Seeds* about two, nearly orbicular, or a little compressed, smooth, of a dark brownish-black, seven-eighths of the margin is surrounded with the eye as in *Carpopogon*; they are the size of a chesnut, and surrounded with a soft, spongy, greyish, yellow substance.

12. B. *piperifolia. R.*

Scandent, smooth. *Leaves* entire, cordate, from five to seven-nerved, lucid. *Panicles* terminal. *Legumes* from round to oval, one or two-seeded.

A large scandent species, a native of the mountain forests north of Silhet, where it blossoms about the beginning of the cold season. II. 328

13. B. *anguina. R.*

Scandent. *Stem* compressed, flexuose; *flexures* approximate, regularly and alternately concave and convex on the two flat sides. *Leaves* subcordate, smooth, entire, or two-lobed; *lobes* subtriangular, and acuminate. *Panicles* terminal, flowers triandrous. *Legumes* oval, smooth, from one to two-seeded.

Na ga-ma-valle. *Rheed. Mal.* 8. *t.* 30 and 31.

Folium linga. Rumph. Amb. 5. *t.* 1. cannot be this, and to it I have retained the old Linnean specific name *scandens*, though some other might be better, as there are many scandent species now known.

Nag-poot is the vernacular name in Silhet.

This is the most extraordinary as well as one of the most extensive ramblers I have met with. It is a native of the mountainous tracts in the vicinity of Silhet, Chittagong, &c. and the most regularly serpentine pieces of the stems and large branches are carried about by our numerous mendicants, to keep off serpents. Flowering time about the end of the rains, and the seeds ripen in the cool season. *Stems* and large *branches* flat being from four to six inches broad, scarcely half an inch thick, when old the margins become double, like the letter V or T, and pretty straight, whereas the body, or space between them, is most regularly flexuose, with the flexures alternately convex and concave. *Bark* rather rough, and ill defined. Wood hard, but porous, and nearly white. *Branches* and *branchlets* bifarious, and regularly alternate, from the flexuose parts just mentioned. *Tendrils* simple, or bifid, permanent. *Leaves* bifarious, alternate, petioled; on the older plants entire or nearly so, and round-cordate; on young plants; and on the luxuriant shoots, more or less bifid, with the lobes narrow and tapering much to their points; from five to seven-nerved, smooth on both sides, from two to six inches each way. *Panicles* terminal, composed of long, simple racemes, of numerous, very small white flowers. *Calyx* cup-shaped, unequally five-toothed. *Petals* five, obovate, short-clawed. *Stamina* only three, all fertile. *Germ* short-pedicelled, oblong, inserted on the under margin of a large, two-lobed gland, which occupies the centre of the flowers, one-celled, two-seeded. *Style* short. *Stigma* simple. *Legume* oblong, thin, with the edges even, and the apex a small recurved point, both sides smooth, about two inches long, and one broad, one-celled. *Seeds* one or two, oval, with an obtuse point on the anterior upper part, which is formed by the radicle compressed, smooth. *Integument* in the recent state single. *Perisperm* in considerable quantity in the fresh seed. *Embryo* curved, &c. as in the sides. II. 329

14. B. *corymbosa. R.*

Scandent. *Leaves* two-parted; *lobes* semicordate, obtuse, two or three nerved. *Corymbs* terminal; *flowers* triandrous; *petals* spatulate, and curled. *Legumes* linear, from six to twelve-seeded.

This very extensive delicate species, is a native of China; from thence seeds were sent to the Botanic garden at Calcutta, where in five years the plants raised from them began to blossom abundantly in April, and ripened their seed in the rainy season.

Stem scarcely any thing that deserves the name, but many, long, slender branches, and branchlets, climb and spread in every direction to an extent of many fathoms, running over high trees, &c. *Bark* smooth, that of the old ligneous parts dark-brown; of the young shoots green, and often coloured. *Tendrils* opposite, simple, short. *Leaves* alternate, bifarious nearly round, smooth, divided for about three-fourths down; length and breadth about one inch and a half, lobes semicordate, very obtuse, from two to three-nerved. *Stipules* ensiform. *Corymbs* terminal on the short lateral branchlets, short peduncled. *Flowers* of a middling size, white with a faint tinge of pink, fragrant. *Pedicels* long, jointed at the middle; the upper portion, or rather tube of the calyx clavate. *Bractes* filiform. *Calyx*, here, and I believe in all our Indian species, ought to be described with a long slender tube, and five-parted border. *Petals* five, equal, spatulate, elegantly curled, spreading. *Filaments* from the mouth of the tube of the calyx; three long and fertile, and from two to five small, and abortive. *Anthers* oval, two-lobed. *Germ* linear, curved, smooth, rising on a pedicel, with the three fertile stamina, from II. 330

Page Carey Ed. the lower edge of the mouth of the tube of the calyx, one-celled; *ovula* many, attached to the upper margin. *Style* short. *Stigma* large. *Legume* thin, from four to five inches long, and three-fourths of an inch broad, smooth, dark brown, from six to twelve-seeded.

15. B. *semibifida. R.*

Scandent. *Leaves* subovate, deeply two-lobed. *Stipules* broad-falcate. *Racemes* terminal. *Calyx* five-leaved. *Petals* oblong, claved. *Stamina* three, with two rudiments. *Legume* flat, smooth, few-seeded.

A native of the Malay Archipelago; from Sumatra it has been introduced into the Botanic garden at Calcutta where it blossoms in October and November; the seeds ripen in April.

Stems and *branches* ligneous, scandent, much bent in various directions. *Bark* of the young shoots clothed with much ferruginous pubescence. *Leaves* bifarious, petioled, subobovate, deeply two-lobed, from seven to nine-nerved; *lobes* linear oblong, obtuse, pretty smooth on both sides; length of the whole leaf from three to five inches, and the breadth from two to four. *Petioles* round, villous, half the length of the leaves. *Stipules* broad-falcate, obtuse.

II. 331 *Tendrils* simple, ligneous permanent. *Racemes* terminal, erect, solitary, large, many-flowered. *Flowers* white, changing to pale yellow when the stamina drop, pretty large, opening in succession from the base up, fragrant. *Peduncles* and *pedicels* round and clothed with rust coloured down, like the other tender parts; the latter from one to two inches long, ascending; apex clavate, this club or enlargement is hollow, with a perforation from the apex immediately within the attachment of the pedicel of the germ, and as it is common to all, it may very properly be called the tube of the calyx. *Bractes* minute, caducous at an early period. *Calyx* of five linear, thick, fleshy, reflexed, caducous leaflets. *Petals* five oblong; *base* tapering into claws, the exterior two large, the inner one very small. *Filaments* five, the three exterior ones fertile, incurved, shorter than the two longest petals, smooth, white, the two inner ones minute. *Anthers* very large, incumbent. *Germ* short, thick and villous. *Stigma* very large, and clammy. *Legume* sublanceolate, thin, very smooth, of a dark chesnut colour. *Seeds* a few, nearly round, flat, and smooth.

16. B. *ferruginea. R.*

Scandent. *Leaves* subrotund, two-lobed. *Racemes* terminal, solitary. *Tendrils* solitary. *Petals* lanceolate, obtuse, downy on the outside. *Filaments* five, three with anthers, and two sterile.

A very large, woody, scandent species, a native of the Malay Islands, &c. about the straits of Malacca.

17. B. *integrifolia. R.*

Scandent. *Leaves* subrotund, emarginate; floral leaves, cordate, acute. *Corymbs* panicled. *Filaments* five, three with anthers, and two sterile.

A large, woody, climbing species, a native of Pulo Pinang.

II. 332 *Stem*, and larger *branches* woody, climbing over trees, &c. *bark* smooth; *young shoots* covered with dark rust-coloured down. *Leaves* alternate, petioled, orbicular, emarginate, otherwise entire, smooth on both sides; from seven to eleven-nerved, size very various. *Floral* leaves cordate, with downy nerves and petioles. *Tendrils* generally axillary, simple, or two-parted. *Corymbs* terminal, and from the exterior axils, numerous, forming large terminal panicles; every part covered with much dark rust-coloured down. *Flowers* very numerous, small, of a pale yellowish colour. *Bractes* solitary, one-flowered, oblong, concave, caducous. *Calyx* with a tubular base. *Border* often divided into five parts. *Petals* oval, subequal, waved, expanding. *Claws* hairy. *Filaments* five, three with anthers, longer than the pistil; two sterile, rather shorter than the petals, and very slender; the whole, with the style, ascend in an elegant curve. *Germ* pedicelled, very hairy, from three to four-seeded, inserted on the lower margin of the mouth of the tube of the calyx. *Stigma* peltate.

18. B. *cordifolia. R.*

Smooth in every part. *Leaves* cordate, from three to five-nerved. *Corymbs* terminal. *Flowers* triandrous, long-pedicelled. *Stigma* peltate.

A native of the Moluccas.

CASSIA. Tourn. Gært.

Calyx five-leaved. *Petals* five, nearly equal. *Filaments* unequal. *Anthers* opening by two slits on the front.

Note. The genus *Cassia*, like many others, is now, more extensive than convenient, I have therefore, with Gærtner separated the lomentaceous species from the leguminous. The former under the old generic name *Cassia* and the latter *Senna*.

II. 333 The first are trees of great beauty, particularly when in flower, the *leaves* pinnate; no glands on the common *petioles* but *stipulate* at the base. *Flowers* on axillary racemes. *Calyx* of five equal leaflets. *Corol* of five nearly equal petals. *Stamina* very unequal; the three lower filaments much longer than the rest, with a double curve below the middle, and in two of them, a large swelling at the middle. *Loment* cortical, cylindric, pendulous, many-celled, with one seed in each. *Embryo* straight, furnished with a hard *perisperm*, large, roundish *Cotyledons*, and a centrifugal radicle.

1. C. *fistula. Willd.* 2. *p.* 518.

Leaflets about five pair, ovate oblong. *Racemes* pendulous. *Loment* cylindric, pendulous; partitions lined with soft sweet pulp.

Sans. Soovurnuka.

Beng. Soondali.

Hind. Unultuss.
Teling. Pela.
Conna. *Rheed. Mal.* 1. *t.* 22.

Page Carey Ed.

A native of various parts of the East Indies, as well, I presume, as of the west; as young trees reared from West India seed, now ten years old, do not in any respect differ from these of the East, both are now, April, in full flower, and the seeds are ripe about nine, or ten months afterwards.

Trunk short. *Bark* smooth, of a light ash-colour. *Branches* numerous, spreading in every direction; general height of full grown trees from twenty to thirty feet. *Leaves* alternate, bifarious, pinnate, from twelve to eighteen inches long, deciduous in the cool season, and appearing with the blossoms in April. *Leaflets* from four to eight pair, five the most common, opposite or nearly so, short petioletted, the inferior ones broad-ovate, the superior ones oblong, entire, generally obtuse or emarginate, polished on both sides, from two to six inches long and from one and a half to three broad. *Petioles* round, without glands. *Petiolets* vermicular. *Stipules* minute, conic. *Racemes* pendulous, simple, from one to two feet long. *Flowers* large, bright yellow fragrant, diverging on long slender, smooth pedicels. *Calyx* of five, nearly equal, oval, smooth leaflets, which are much shorter than the corol. *Petals* equal in shape; viz. oval, but differing in size. *Filaments* the three lower much longer than the others and having a double curve, but no swelling, as in some of the other species with cylindric filaments. *Anthers* on the three long filaments oblong, opening by two lines on the face, the other seven clavate, with pores at the small end. *Germ* pedicelled, filiform, smooth, one-celled, containing numerous seeds, which at this period are without any sign of separation, that appearing in the advanced state, attached to the upper margins. *Style* short, incurvate. *Stigma* conic, smooth. *Loment* cylindric, pendulous, &c. as described by the accurate *Gærtner, vol.* 2. *p.* 313 *t.* 147.

II. 334

The tree is uncommonly beautiful when in flower, few surpassing it in the elegance of its numerous long, pendulous racemes of large, bright yellow flowers, intermixed with the young, lively green foliage.

2. C. *rhombifolia. R.*

Leaflets about five-pair, rhombiform, polished. *Racemes* pendulous. *Loment* cylindric, partitions lined with soft bitter pulp.

A native of Ceylon, from thence General Hay Macdowall sent seeds to the Botanic garden at Calcutta in 1802. In six years the plants therefrom have attained to the height of twenty feet. It blossoms during the months of May and June, and the seed ripens in February, March, and April.

Trunk straight. *Bark* light ash-coloured, and smooth. *Branches* spreading, with bark like that of the trunk. *Branchlets* bifarious, flexuose, round, and smooth. Their base often remains, and resembles rude thorns. *Leaves* alternate, bifarious, pinnate, rather more than a foot long. *Leaflets* from three to seven pair, opposite, short petioletted, tapering equally at both ends, rhombiform, entire, obtuse, polished; from two to four inches long, and from one to two broad. *Petioles* round, slender, no glands. *Petioles* vermicular. *Racemes* from the leafless branchlets of the former year, also axillary, solitary, or in fascicles, pendulous. *Flowers* large, bright yellow, on long slender diverging pedicels. *Bractes* tern, lanceolate, very early caducous. *Calyx* of five, nearly equal, oblong, obtuse, concave, smooth leaflets. *Petals* five, nearly equal, spreading; oblong, obtuse, concave. *Filaments* the lower three as long as the pistillum. They have a double curve at the base and ascend in a semicircle. *Anthers* on the three long filaments, oblong, and opening in two lines on the face, those of the other seven clavate, with two pores at the small end. *Germ* pedicelled, filiform, smooth, ascending in a semicircular curve, with the three long filaments, one-celled, in which are numerous seeds attached to the upper margin. *Style* short. *Stigma* minute. *Loment* cylindric, pendulous, above two feet long, and scarcely so thick as the little finger, having the sutures sometimes strongly marked with *Cortex* dark brown, smooth, and hard, and the bristle as in C. *fistula*, many-celled, about four in every inch, but not opening spontaneously. *Partitions* lined with soft, black, bitterish pulp. *Seeds* one in each cell, round, obcordate, the size of a small pea. *Integument* simple, hard, and polished. *Perisperm* conform to the seed, of a hard tough texture, and pale ash-colour, even while fresh. *Embryo* straight, pale yellow. *Cotyledons* nearly round, and so large as to extend to the integument all round, dividing the perisperm. *Plumula* of one pectinate lobe. *Radicle* roundish, immediately within the umbilicus.

II. 335

It differs from C. *fistula* in the shape of the leaves, more slender loment, and general habit of the trees.

3. C. *nodosa. Buch.*

II. 336

Leaves bifarious; *leaflets* ten-paired, oblong. *Stipules* obliquely crescent-shaped, with a bristle at each angle. *Racemes* lateral. Three lower filaments with a globular swelling near the middle.

A native of Chittagong. In the Botanic garden at Calcutta it flowers in April.

Trunk short; in one tree twelve years old, it is thirty-eight inches in circumference. *Bark* smooth. *Branches* numerous, bifarious, spreading much; *young shoots* slightly pubescent, grooved, and flexuose. *Leaves* bifarious, spreading, about a foot long or more. *Leaflets* from eight to twelve pair, toward the apex narrower and sub-lanceolate; the lower pairs ovate and ovate-lanceolar, all are smooth and entire, from two to three inches long. *Petioles* round, slightly villous, without glands. *Stipules* obliquely crescent-shaped, with the extremities lengthened into long subulate spurs. *Racemes* lateral, on the naked, two or more year-old branchlets, simple. *Bractes* three-fold, one-flowered, narrow lanceolate, the lateral pair smaller. *Pedicels*

Page Carey Ed. slender, villous, diverging, about two inches long, one-flowered. *Flowers* large, of a beautiful pale pink colour. *Leaflets* of the calyx equal, ovate. *Petals* lanceolate, nearly equal, eight or ten times longer than the calyx. *Filaments* ten, very unequal; the lower three much longer, each with a globular swelling near the middle and a double curve below it. *Anthers* on the three long filaments opening on the sides, the rest opening by two pores at the base. *Germ* pedicelled, incurved, cylindric, one-celled, containing numerous seeds attached to the upper suture or concave side. *Style* very short. *Stigma* minute, green. *Loment* cylindric, pendulous, about two feet long, more than eighty-celled, with transverse partitions, lined with a dry substance. *Seed* solitary. *Perisperm* in small quantity, and particularly yellow. *Embryo* as in
II. C. *bacillus*, &c. *see Gært. sem.* 2. *p.* 313.
337 4. C. *bacillus. Gært. sem.* 2. *p.* 313.

Leaflets from ten to twelve pair, oblong, or oval, obtuse. *Stipules* crescent-shaped, adnate. *Racemes* terminal, on short lateral branchlets. The three lower filaments with an oval, swelling near the middle.

Cassia fistula silvestris. *Rumph. Amb.* 2. *t.* 22.

A native of the Malay Islands. From seed received from Sumatra into the Botanic garden at Calcutta many trees have been reared. They blossom during the hot season and ripen their seed in February. When in flower it is by far the most beautiful *cassia* I have yet seen.

Trunk of our young trees rather crooked and leaning to one side. *Bark* smooth, dark brown, spreading almost horizontally, with alternate, bifarious spreading-flexuose branchlets *Spines*, the base of many of the branchlets become such, and of great strength, and size. *Leaves* alternate, bifarious, pinnate, from six to twelve inches long. *Leaflets* generally from eight to fourteen pair though on the small lateral floriferous branchlets they are often only from two to three or four pair, all very short petioletted, oval, or oblong, entire, very obtuse or even marginate and smooth; from one to two inches long and about half that in breadth. *Petioles* without glands. *Stipules* crescent-shaped, lower half narrower, and less obtuse, the upper half much broader and emarginate, with a bristle. *Racemes* terminal, on short lateral branchlets. *Bractes* ten, cordate, cuspidate, one-flowered. *Pedicels* long, and slender. *Calyx* of five, ovate, dull reddish leaflets, many times smaller than the corol. *Petals* oblong, differing in size only, of a lovely pink or rose colour. *Stamina* all fertile, the three lower filaments much longer, and having each an oval swelling near the middle and a double curve below it. *Anthers* on the three long filaments ovate; on the other seven incumbent, with pores at the
II. small end. *Germ* long-pedicelled, subulate, one-celled, containing numerous seeds attached
338 to the upper suture. *Loment* cylindric, from eighteen to twenty-four inches long and about three quarters of an inch in diameter, covered with very dark brown, rather smooth, torose bark, &c, as in *cassia fistula*, which it resembles so exactly that the soft sweet pulp of *fistula* is the only distinguishing mark. In this species the cells between the seventy or eighty partitions are filled with a spongy substance in which is a roomy cell for each seed. *Seed* solitary, obovate, a little compressed, the size of a pea, smooth, of a shining brown colour. *Integument* simple, when fresh rather soft and tough. *Perisperm* of a tough, soft, horny texture, and brownish colour. *Embryo* straight, yellowish. *Cotyledons* two, oval, cordate, three-nerved. *Plumula* two-lobed, one large, and pinnatifid, the other a minute point. *Radicle* oval, lodged immediately within the umbilicus.

5. C. *marginata. R.*

Leaflets fifteen pair, oblong, margined. *Stipules* semisagittate. *Racemes* axillary.

A native of Ceylon introduced into the Botanic garden at Calcutta by General Macdowall in 1802, where it blossoms during the rains, and ripens its seed in March and April. The tree is at all times uncommonly beautiful and particularly so when in flower.

Trunk tolerably straight, in trees six years old about two feet in circumference, and covered with deeply cracked, dull light brown-coloured *bark*. *Branches* spreading much, secondary *branches*, and *branchlets* bifarious and horizontal. *Bark* of the larger *branches* greenish, ash-colour, spotted with brownish spongy excrescences; *tender shoots* flexuose, furrowed and villous. *Leaves* alternate, bifarious, drooping a little, pinnate, from six to ten inches long. *Leaflets*
II. from ten to twenty pairs, linear-oblong, often emarginate, a little villous underneath, having
339 the margins coloured, and somewhat thickened, about one inch long and half an inch broad. *Petioles* channelled, villous, with glands upon them. *Stipules* semisagittate, both barbs and the apex cuspidate and curved. *Racemes* axillary, solitary, much shorter than the leaves. *Bractes* tern, lanceolate, the inner two on the base of the pedicel, and much smaller. *Flowers* of a middling size, pink colour, marked with greenish nerves and veins. *Petals* nearly equal, three on the upper side and two on the under. *Stamina* all semifertile; the three lower ones much the longest and with a double curve below the middle, but no swelling as in C. *nodosa*, and some of the other species, the anthers on the three long filaments, are ovate and erect, all the others are incumbent, with pores at the small end. *Loment* cylindric, from eight to twelve inches long, and as thick as a man's little finger, covered with a dark brown, torose, somewhat ligneous bark; divided by transverse partitions, into thirty or forty cells, in which is lodged, a soft, white, spongy substance which involves the seeds. *Seeds* solitary, obovate, size of a small pea. *Integuments* single, smooth, light brown. *Perisperm* conform to the seed, soft, and tough, divided to the base into two lobes by the large cotyledons. *Embryo* straight, green. *Cotyledons* oval-cordate, three-nerved, transversely curved like the letter S. *Plumula* of two very unequal lobes, the largest pinnatifid; the smallest a mere point. *Radicle* roundish, immediately within the umbilicus.

SENNA. Gært.

Page Carey Ed.

Calyx five-leaved. *Corol* irregular, five-petalled. Fertile anthers beaked, opening by two pores at top.

1. S. *exigua. R.*

Leaflets two pair, oval. *Stipules* and *bractes* filiform. *Flowers* tetrandrous. II. 340

A minute, erect, flexuose, hairy plant, with small yellow flowers, in small subterminal racemes. A native of Bengal ; it flowers about the close of the rains.

2. S. *absus. R.*

Biennial, clammy. *Leaflets* two pair, obovate. *Flowers* pentandrous. *Stamens* five, equal. *Legumes* straight, hairy, six-seeded.

Cassia absus. *Willd.* 2. 514.

A small bi-or triennial, ramous species, every part of which, the leaves excepted, is covered with glutinous hairs.

Leaves alternate, bifarious, twice-paired. *Leaflets* obliquely-oval, obtuse, somewhat hairy on the under side ; about an inch long. *Petioles* the length of the leaflets. *Glands* an awled one between each pair of leaflets. *Stipules* acute. *Racemes* either opposite to the insertion of the leaves or nearly so, or terminal, few flowered. *Flowers* yellow, small. *Pedicels* bracted at the middle. *Calyx* glandular. *Stamens* five, equal, no rudiments of more ; the anthers opening by a slit on each side of the pointed apex and not by round lobes in the apex. *Legumes* hairy, six-seeded. *Seeds* black.

3. S. *Tora. R.*

Annual. *Branches* spreading. *Leaflets* three-paired, obovate-cuneate, a subulate gland between each of the lower two pairs. *Stipules* subulate. *Flowers* in axillary pairs. *Legumes* long, recurved, subcylindric. *Seeds* numerous.

Cassia tora. *Willd.* 2. 515.

Sans. Prusni-purni.

Beng. Chakunda.

Teling. Tantim.

A little more robust than the last, and a native of the same country. In flower and seed great part of the year. II. 341

4. S. *toroides. R.*

Annual. *Leaflets* three pair, cuneate, obovate, a subulate gland between the lower pair only. *Flowers* in axillary pairs on a short common peduncle. *Stipules* subulate. *Legume* linear, four-sided.

The seeds of this plant were sent from Mysore to the Botanic garden at Calcutta by Dr. Buchanan in 1800, and about the close of 1801 the plants blossomed.

Stem annual, erect, somewhat woody *branches ;* spreading, height of the whole plant about six feet. *Leaves* pinnate, spreading or drooping. *Leaflets* three pair, occupying the exterior half of the petiole, obovate-cuneate, sessile, entire, villous ; the lower pair smaller ; all somewhat acuminate, with a small soft bristle, from one to two inches long. *Glands*, a single, yellow, subulate one between the lower pair of leaflets only. *Stipules* subulate, villous. *Flowers* axillary, in pairs, large, yellow, on long pedicles, inserted on a short common peduncle, with some small bractes about the insertion, one of the two uniformly proves abortive. *Petals*, the upper one obcordate, the rest oval. *Filaments*, the three upper ones minute, and abortive ; the lower seven nearly equal and fertile. *Legume* long, straight, four-sided, with a double groove, or three keels on each margin, from six to nine inches long. *Seeds* numerous, from twenty to thirty, trapeziform, smooth, pale brown.

This plant is allied to C. *Tora.* The best specific difference is one gland only, and that between the lower pair of leaflets, in *Tora* there are always two, that is one between each of the two lower pairs. But in appearance and smell the difference is very great. This grows nearly erect, to the height of six or more feet, and has little or no smell whereas in the same soil, and with the same treatment. *Tora* is diffuse, rarely more than one or two feet high, the flowers and legumes are much smaller, and the smell very different. II. 342

5. S. *aurata. R.*

Shrubby. *Leaflets* three pair, ovate-oblong, pointed, smooth, having a conic gland between each pair. *Stipules* and *bractes* ensiform. *Racemes* corymbose. *Legumes* cylindric, obtuse, pendulous.

A stout, lucid, very handsome shrub, with many large, bright gold coloured flowers ; a native of the countries and islands to the eastward of the Bay of Bengal. In the Botanic garden at Calcutta it blossoms freely during the rains and the seed ripens in the cool season.

6. S. *bicapsularis. R.*

Shrubby, with long, weak, slender, smooth, subscandent branches. *Leaflets* four-pair, obovate ; a globular yellow gland between the lower pair. *Stipules* subulate. *Racemes* axillary, as long as the leaves. Two of the anthers much larger. *Legume* torulose, many-seeded.

Cassia *bicapsularis. Willd.* 2. 516.

Probably not a native of India ; how it came into the Botanic garden at Calcutta is uncertain, but there it is now common, and blossoms about the close of the rains in September and October.

7. S. *purpurea. R.*

Annual, erect, smooth. *Leaflets* from four to six pair, lanceolar, on hemispheric glands at the base of the petiole, the lower one and three superior stamens sterile. *Legumes* turgid, many-seeded.

Page Carey Ed.

Beng. Kala-Kalkashinda.

Teling. Conda kashinda.

A large, erect, ramous, annual species, a native of the mountainous parts of the Coast. I have raised it from seeds in my garden, and from these plants this description is taken. Flowering time the cold season, the whole plant is about three feet high.

II. 343 *Stem* erect, as thick as the little finger, round, smooth, somewhat woody, purple coloured. *Branches* numerous, ascending, a little flexuose, very smooth; of a deep, clear, reddish purple colour. *Leaves* remote, from four to six-paired. *Leaflets* oblong, lanceolar, smooth, entire, ending in a soft bristle, the interior one generally the largest; in breadth nearly equal, from one to one and a half inches long, and about half an inch broad. *Petioles* smooth, purple, channelled. *Glands* a semiglobular one near the base of the petiole. *Racemes* axillary, solitary, shorter than the leaves, few-flowered. *Flowers* pretty large, bright yellow. *Bractes* broad lanceolate, falling. *Stamens* as in the genus, except that, as in C. *sophora* and *esculenta*, the inferior one is small, and sterile. *Stigma* incurved, perforated. *Legumes* sub-cylindric. *Seeds* very numerous.

8. S. *occidentalis. R.*

Annual, erect, ramous. *Leaflets* four or five pairs, ovate lanceolate, acuminate, having a dark brown, polished, hemispheric gland on the tumid base of the petiole. *Legume* linear, subcylindric.

Cassia *occidentalis. Willd.* 2. 518.

A native of Bengal. Flowering time the rainy season. The smell of every part heavy and offensive in the extreme.

II. 344 *Stem* erect, smooth, rather polished, somewhat ligneous, though generally annual. *Branches* many, ascending, flexuose, smooth, coloured with a mixture of dark purple and green; height of the whole plant from three to six feet. *Leaves* alternate, pinnate, from four to eight inches long. *Leaflets* four or five pair, the lowermost ovate, and smallest, the superior ones ovate-oblong and much larger, all smooth, entire, and acuminate, from one to three inches long, and from one to one and a half broad. *Petioles* nearly round, and smooth; on the green tumid base is a polished, dark brown, hemispheric gland. *Stipules* semi-ovate, acuminate, curled, caducous. *Flowers* terminal and axillary, when terminal they form an uninterrupted raceme; when axillary they are three, four, or five, on a very short, common peduncle. *Pedicels* much longer than the peduncle. *Calyx*, scarcely half the length of the corol. *Corol*, the lower two petals, rather smaller than the other three, and closer together. *Filaments*, the lower one small and abortive, the next pair largest, the next two pairs smaller, and with the large pair, fertile, the upper one small, and barren. *Legume* nearly straight, when full grown about as thick as a rattan and nearly cylindric. *Seeds* numerous.

9. S. *obtusa. R.*

Diffuse. *Leaflets* five-pair, obovate obtuse. *Petioles* without glands. *Stipules* cordate-lanceolate. *Racemes* axillary. *Legume* lunate.

Cassia *senna. Burm. H. Ind. t.* 33. *f.* 2.

A native of the high, dry, uncultivated lands of Mysore, where the leaves are used as a substitute for *senna*. The seeds were sent by Dr. Buchanan from Seringapatam to the Botanic garden at Calcutta, where the plant thrives well, flowering and ripening its seed most part of the year.

II. 345 *Root* perennial. *Stems* scarcely any, but many straggling branches resting on the ground. *Leaves* nearly bifarious, five or six inches long. *Leaflets* from four to six pairs, linear-oblong, with the exterior pair more cuneate, all obtuse, and somewhat villous, about one inch long. *Petioles* slightly channelled without any appearance of glands. *Stipules* tapering, from an ovate-cordate base. *Racemes* axillary, solitary, shorter than the leaves, bearing a few small, yellow, short-pedicelled flowers. *Bractes* ovate-cordate, acuminate, concave, one-flowered. *Calyx* about a third shorter than the corol. *Filaments*, the two uppermost small and sterile. *Legume* broad, thin, lunate, transversely grooved, in other respects smooth; about two inches long and three quarters of an inch broad. *Seeds* from six to eight, wedge-shaped, rugose, &c. as in *Cassia senna.*

10. S. *arborescens. R.*

Arboreous. *Leaflets* five or six pairs, oblong, with a pedicelled gland between each of the lower two or three pairs. *Stipules* falcate. *Racemes* axillary. *Legumes* linear, thin, pendulous, many-seeded.

Cassia arborescens. *Willd.* 2. 520.

C. *glauca. Lamarck's Encycl.* 1. 647.

Wellia tagera. *Rheed. Mal.* 6. *t.* 9. *and* 10.

It is a native of various parts of India, and in blossom in the Botanic garden at Calcutta most part of the year.

Trunk rarely straight and in length and size very various. *Branches* numerous, spreading in every direction. *Bark* of the trunk, and larger branches of a brownish ash colour, and tolerably smooth; that of the young shoots smooth and green. *Leaves* scattered, pinnate, from six to ten inches long. *Leaflets* from four to six pair, elliptic; the inferior pairs smallest, and broader in proportion to their length; smooth on both sides, and of a pale green colour, the superior pair about three inches long, and about one and a quarter broad. *Petioles* round, smooth, having a pedicelled, brown, round gland between each of the lower two or three pairs of leaflets. *Stipules* falcate, incurved. *Racemes* axillary, solitary, about half the length of the leaves erect, bearing near the apex, many, large, pale yellow, long-pedicelled flowers. *Bractes* solitary, one-flowered, elliptic, revolute, caducous. *Calyx*, leaflets very unequal, pale yellow,

smooth. *Petals* nearly equal, expanding. *Anthers* all fertile, and nearly equal, though the inferior two have much longer filaments than the other eight. *Legumes* linear, thin, contracted between the seeds, smooth, pendulous, from six to eight inches long, and about three quarters of an inch broad. Page Carey Ed. II. 346

11. S. *officinalis. Gært.*

Biennial, ramous. *Leaflets* six-paired, lanceolar, no glands. *Stipules* acute, expanding. *Racemes* axillary. *Legumes* oblong, incurved, thin.

Cassia *Senna. Willd.* 2. 520.

Arab. Suna, or Sena.

A native of the interior of India, as well of Arabia, &c.

12. S. *esculenta, R.*

Annual, erect. *Leaflets* seven or eight pair, lanceolate, acute. *Racemes* terminal, panicled. *Legumes* linear, turgid, many-seeded.

Teling. Nutee-kashinda-kura.

A large, erect, annual, much like *cassia sophora*, but not so very offensive in its smell. It grows about hedges, rubbish, &c. with that plant, but is not so common. Flowers during the cold season.

Stem erect, flexuose, a little furrowed, commonly from two to three feet high. *Branches* few, nearly erect, axillary, in form like the stem. *Leaves* alternate, abruptly-pinnate, six or seven inches long. *Leaflets* from six to nine pair, lanceolate, acute, entire, smooth, soft, when young a little downy; two or two and a half inches long, and three-fourths of an inch broad. *Petioles* channelled, ending in a brown bristly point. *Glands* a clubbed one near the base of the petiole. *Stipules* small, caducous. *Racemes* terminal, and from the exterior axils, the terminal one a large, compound pannicle, the axillary ones smaller and simple. *Flowers* middle-sized, yellow. *Stamens*, the lower one small and sterile, the next two large; the next four middle-sized; the upper three small and sterile.

The smell of this plant is heavy, and disagreeable. Its leaves are eaten in curries by the natives. II. 347

13. S. *sophora. R.*

Annual, erect. *Leaves* from eight to ten-paired, lanceolar, smooth; the lower much smaller, a clavate gland at the base of the petiole. Upper petal retuse. The lower and three upper stamina sterile. *Legume* linear, turgid, many-seeded.

Cassia *sophora. Willd.* 2. 525.

Beng. Kul-kashinda, and the dark purple variety, which is as common as the green, they call Kala-kul kashinda.

Ponnam-tagera. *Hort. Mal.* 2. *t.* 52.

Gallinaria acutifolia. *Rumph. Amb.* 5. *t.* 97. *f.* 1.

A native of Bengal, &c. Flowering in the rainy and cold season.

14. S. *speciosa. R.*

Arborescent. *Leaflets* from eight to nine-paired, oblong, obtuse, having a smooth pedicelled gland between the lower two, or three pairs. *Racemes* axillary, long-peduncled. *Legumes* leafy, linear.

This species I have only found in gardens; there it is a most shewy plant, and in flower most part of the year.

Trunk erect. *Branches* many, ascending. *Leaves* numerous, about six inches long. *Leaflets* from eight to nine pair, oblong, obtuse, smooth, the interior pairs largest; a pedicelled gland between each of the lower two or three pairs. *Stipules* ensiform, inflexed. *Racemes* axillary, solitary, long-peduncled. *Flowers* numerous, large, yellow. *Bractes* solitary, one-flowered, lanceolar oblong. *Stamens*, all the ten fertile. *Legumes* thin, leafy, about six inches long, and less than one broad.

15. S. *Sumatrana. R.*

Arboreous. *Leaflets* from six to ten pairs, oblong, emarginate, smooth, glands none. *Stipules* minute, subulate. *Panicles* terminal. *Legumes* linear, compressed, many-seeded. II. 348

The seeds of this quickly growing, beautiful, stately, useful species were sent to me from Bencoolen by Dr. C. Campbell in the beginning of 1800, and in two years the young trees reared from them, were not less than from ten to twenty feet high, and stout in proportion. In August, 1801, they blossomed for the first time and ripened their seed in April, 1802. Now, 1809, they have grown to a very great size for their age, with a trunk thirty-six inches in circumference and four feet above ground.

Trunk straight and covered with smooth, olive-coloured bark. *Branches* few, spreading. *Leaves* numerous, alternate, pinnate, from six inches to a foot long. *Leaflets* from four to fourteen pair, opposite, short-petioletted, oblong, entire, smooth, polished, of a deep, shining green, the exterior pairs largest; are entire, more or less emarginate, with a small bristle at the apex; from two to three inches long and from half an inch to an inch broad. *Petioles* smooth and channelled, no glands. *Stipules* minute, subulate, caducous. *Panicles* terminal, very large, erect, ovate, composed of many alternate, corymbiform racemes. *Flowers* numerous, large, bright yellow. *Bractes* lanceolate, concave, one-flowered. *Calyx* of five, unequal, pale yellow, roundish, concave reflexed leaflets, about one-third the length of the corol. *Corol* the superior petal small, longer-clawed, and obcordate; the other four nearly equal, and almost round. *Filaments* seven fertile ones, but as in the genus, differing much in size; the three uppermost barren, and small. *Legumes* linear, thin, swelled a little at the seed, smooth, both margins rounded, of a dark brown, from six to eight inches long. *Seeds* many, thin, oval, of a dark shining brown colour.

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Dr. Campbell says that it is one of their most useful trees in Sumatra, is of rapid growth, and the wood not inferior to Ebony when old. I may add that in Bengal its growth is also uncommonly rapid and the tree one of the most beautiful the country can boast of.

16. S. *auriculata. R.*

Shrubby. *Leaflets* ten-paired, oblong. *Stipules* ear-shaped. *Racemes* terminal, corymbiform. *Legumes* membranous, from ten to twelve seeded.

Cassia auriculata. *Willd.* 2. 526.

Teling. Tangheroo.

It is one of the most common shrubs on the coast of Coromandel, looks well, and is in flower during the whole of the year.

Stems trifling, crooked. *Branches* spreading in all directions; *bark* dark-coloured, and pretty smooth; the whole plant is in general from four to eight feet high. *Leaves* scattered, from eight to twelve-paired. *Leaflets* oblong, entire, mucronate, a little downy. *Glands* a subulate one between each pair of leaflets. *Stipules* kidney-form, behind is a long spur on the side next the petiole. *Racemes* terminal, and from the exterior axils, sometimes compound, corymbiform. *Bractes* three-fold at the insertion of the pedicels. *Flowers* large, numerous, bright yellow. *Calyx*, the two exterior leaflets small. *Stamens* as in the genus. *Legume* linear, membranaceous, waved, from ten to twelve-seeded.

With the bark the natives commonly tan and dye their leather of a buff colour. It is a pretty strong, simple astringent.

The caterpillar of a large species of silk worm feeds on the leaves of this plant.

17. S. *alata. R.*

Shrubby. *Leaflets* from ten to twelve pair, linear-oblong; no glands. *Racemes* terminal. *Bractes* coloured, caducous. *Legumes* enlarged on each side with a broad crenulated wing. *Seeds* numerous.

Cassia alata. *Willd.* 2. 523. *Herpetica. Jacq. obs.* 2. 24. *t.* 45. *f.* 2.

II. Herpetica. *Rumph. Amb.* 7. t. 18.

350 *Sans.* Dadrooghna.

Hind. and *Beng.* Dad-murdun.

Tam. Wandu Rolli.

Teling. Mitta tamara.

The English, and I believe all other Europeans on this coast, call it also *Mitta tamara.*

It is a large shrub found in our gardens; where it is indigenous I cannot say. In a cultivated state it flowers during the latter part of the wet season, and beginning of the cold. The seeds ripen during the latter part of the cold season.

Stem erect, often as thick as a man's leg, marked by the cicatrices of the fallen leaves, and the permanent stipules, which appear like prickles. *Leaves* scattered, abruptly pinnate, two feet long. *Leaflets* opposite, from eight to fourteen pair, the exterior largest, linear-oblong, obtuse, or emarginate, with a point, smooth, entire, veined; from three to six inches long, and from two to two and a half broad; the lower pair more distant from the next pair than the others above, nearly round and reflexed back on the stem or branches. *Petioles* channelled; the channel large and formed by two thin, firm yellow borders; there is a cross-bar between each pair of leaflets, covered with small dark-coloured bristles and no other gland, each of them terminates in a cordate point. *Stipules* ear-shaped, rigid, pointed, lasting. *Racemes* terminal and from the exterior axils, long, sometimes two-forked, nearly erect. *Flowers* numerous, simple, large, yellow. *Bractes* large, one-flowered, oval, concave, yellow, caducous. *Calyx* coloured like the corol. *Legume* horizontal, from five to six inches long, enlarged with a broad crenulated wing on each side which runs the whole length. *Seeds* numerous.

II. The Telinga and Tamul Physicians say it cures all poisonous bites and other venereal
351 outbreakings, and also strengthens the body. The fresh leaves are very often employed to cure ring-worms. They are well rubbed into the parts affected, once or twice a day, and generally with great success.

Seeds from the West Indies received into the Botanic garden at Calcutta, under the name *Cassia herpetica* produced this very plant.

18. S. *glauca. R.*

Arboreous. *Leaflets* as far as sixteen pair, linear, obtuse, smooth, no glands. *Stipules* minute. *Panicles* terminal, composed of distinct corymbs. *Legume* linear, from eight to ten-seeded, having a conical gland on the upper edge of its pedicel which is particularly conspicuous in the germ.

A pretty large tree, a native of the Carnatic, from hence Dr. Berry sent seeds to the Botanic garden at Calcutta, where it blossoms in November and December, with Senna *Sumatrana* which it much resembles, but differs in the number, and shape of the leaves, the shape of the petals, and the pale glaucus colour of the whole foliage, the seed ripens in March.

Trunk of young three-years-old trees in the Botanic garden erect, thick as a man's leg, with smooth brownish bark. *Branches* spreading; *young shoots* smooth and coloured, whole height of the trees about fifteen feet. *Leaves* alternate, pinnate from six to twelve inches long. *Leaflets* from eight to sixteen pair, linear-oblong, smooth, obtuse, with a slender bristle at the apex, from one to two inches long and about half an inch broad. *Petioles* channelled, and destitute of glands. *Stipules* minute, caducous. *Panicles* terminal, composed of simple, expanding corymbs.

A single, simple, similar corymb is generally found in the axil of each of the exterior leaves. *Flowers* pretty large, yellow. *Petals* the lower pair larger, and more remote from

each other. *Stamens* simple, seven are nearly equal and fertile, the superior three small and sterile. *Legume* linear, very thin ; smooth, somewhat pedicelled, with a gland, or conical process on the upper edge of the pedicel. This is particularly conspicuous in the germ, and is a good specific mark and immediately distinguishes it from S. *Sumatrana* which has no such gland and is the only species known to me, for which it can be mistaken. *Seeds* generally about fifteen, separated by very firm distinct partitions, and attached by convolute slender cords to the upper margin. 352

19. S. *prostrata. R.*

Perennial, prostrate. *Leaflets* minute, twenty-paired, daggered. *Peduncles* from two to three-flowered. *Stamens* five ; all fertile. *Legumes* straight, six-seeded.

Teling. Nalla Jeeloога.

A native of pasture ground. Flowers during the wet and cold seasons.

Root woody, perennial. *Stems* perennial, numerous, spreading every way and pressing close upon the ground, round, a little hairy, about a foot long. *Leaves* pinnate, alternate, bifarious. *Leaflets* from twelve to twenty-six pair, minute, linear, acute, the lower margin ciliate. *Glands*, a long pedicelled, peltate one between the lower pair of leaflets. *Stipules* semilanced, very acute. *Flowers* above the axils, peduncled, small, yellow, from one to three. *Calyx. Leaflets* equal, daggered. *Stamens* five, nearly equal ; no sterile filaments. *Legumes* linear ; *partitions* obliquely-transverse, as is *Galega*, smooth. *Seeds* from six to seven, shining, dark brown.

Cattle eat it.

20. S. *dimidiata. Buch.*

Annual, slender, erect. *Leaflets* thirty pair, with a flat gland between the lowermost. II. *Peduncles* above the axils from two to four-flowered. *Stamens* four, or five, all fertile, but two 353 coloured. *Legume* straight, from ten to fifteen seeded.

A native of Nepal, from thence seeds were sent by Dr. Buchanan, to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and are in blossom and seed most part of the year. It is a beautiful, delicate species.

Root sometimes biennial. *Stems* and *branches* straight ; the lower parts round, and smooth, the superior and more tender parts clothed with a few curved hairs ; the general height of the plants in the Botanic garden is about three feet. *Leaves* alternate, bifarious, pinnate, from two to three inches long. *Leaflets* numerous, semilanceolate, smooth. *Glands* a pretty large one between, or rather under the lower pair of leaflets. *Stipulets* fine taper-pointed. *Peduncles* solitary, rather above the axils, very short, each producing in succession, three or four long-pedicelled, small, yellow flowers. *Stamina* four or five, all fertile, two of the anthers are always coloured. *Stigma* large, with a sharp ciliate margin. *Legumes* straight, smooth, containing from six to twelve, or even fifteen seeds.

21. S. *sensitiva. R.*

Perennial, procumbent. *Leaflets* minute, from forty to fifty pairs. *Peduncles* from one to two flowered. *Stamens* ten, all fertile. *Legumes* straight, many-seeded.

A small, elegant, procumbent plant, growing on pasture ground. It flowers during the wet season.

Root perennial. *Stems* or *branches* many, procumbent, alternate, bifarious, a little hairy, with the extremities ascending, from twelve to eighteen inches long. *Leaves* pinnate, alternate, bifarious, from one to two inches long. *Leaflets* from thirty to sixty pairs, minute, obliquely-oblong, pointed. *Glands*, a round, peltate, sessile one between the lowest pair of leaflets. *Petioles* upper side ridged, notched, with a minute bristle in each of the notches. *Stipules* at 354 the base cordate, tapering to an acute point. *Peduncles* above the axils, one or two, one-third the length of the leaves, one-flowered. *Bractes* one or more embracing the base of the peduncle, and two opposite near the apex. *Flowers* yellow, the stamens being much shorter than the pistil, bow till the germ is impregnated. *Stamens* ten, nearly equal. *Legume* erect, linear, flat, from fifteen to twenty-seeded. II.

Note. It is at first sight very much like S. *prostrata* but on examination they prove very different. The leaves are considerably more sensitive than any other of this genus that I know.

22. S. *tenella. R.*

Biennial, erect, ramous. *Leaflets* from fifty to sixty pair, minute, linear-lanceolate mucronate, a flat gland between the lower pair. *Petioles* sharp-edged and crenulate on the upper side. *Flowers* one or two, rarely three, above the axils. *Anthers* ten, all fertile. *Legume* from ten to twelve-seeded.

It is a native of the interior parts of Bengal, and from thence was introduced into the Botanic garden at Calcutta, by Dr. W. Carey in 1799, where it blossoms during the rains, and the seeds ripen during the cold season.

Root about biennial in the Botanic garden at Calcutta. *Stem* erect, slender, with many expanding, slender, bifarious, somewhat hairy branches, height of the whole plant, in a good soil from two to three feet. *Leaves* alternate, bifarious, pinnate, from two to three inches long. *Leaflets* from forty to sixty pairs, very small, lanceolate, mucronate, and smooth. *Petioles* villous, with the upper-edge sharp and crenulate, and a large flat gland at the lower pair of leaflets. *Stipules* semilanceolate, acute. *Peduncle*, common, a little above the axils short, each bearing in succession two or three, pretty large, bright yellow flowers on long pedicels. *Bractes* one at the base of each pedicel and two below the flowers near the apex of the pedicels. 355 *Calyx ; leaflets* lanceolate, rather shorter than the petals. *Petals* orbicular, the two lower ones smaller than the others. *Anthers* ten, all fertile, alternately larger. *Legumes* linear-cuneate, II.

Page Carey Ed. much compressed, suberect, smooth, from one to two inches long, containing from six to twelve or even more seeds.

POINCIANA. Schreb. gen. n. 701.

Calyx five-leaved. *Petals* five, unequal, the highest longer clawed, more beautifully coloured, and fringed. *Stamina* long, ascending, naked, all fertile.

1. P. *pulcherrima. Linn.*

Shrubby, armed. *Leaves* bipinnate. *Leaflets* oblong, emarginate. *Racemes* terminal, corymbiferm. Claw of the upper petal tubular. *Stamina* much longer than the petals.

Cæsalpinia *pulcherrima Ed. sp. Willd.* 2. 531.

Tsetti-mandarum. *Rheed. Mal.* 6. *t.* 1.

Sans. Krishna-choora.

Beng. Krishna-choora.

Tam. Komri.

Common in gardens all over India, and in flower and seed the whole year. Plants reared from seed from the West Indies do not in any respect differ from those of India.

The trunk of this little tree or large shrub, when old, I have found constantly hollow, and occupied by a large red dark brown ant. From these, when disturbed, they issue forth in numbers, and by their bite inflict a severe and painful punishment on their disturbers.

2. P. *elata. Lin. Spec.* 544.

II 356 Arboreous, unarmed. *Leaves* bipinnate. *Leaflets* linear.

Cæsalpinia *elata. Willd.* 2. *p.* 532.

A native of Coromandel, where it blossoms during the dry season.

Trunk erect, though rarely straight, often as thick as a man's body. *Bark* pretty smooth, ash-coloured. *Branches* numerous, spreading much, the general height of full grown trees from twenty to thirty feet. *Leaves* alternate, bipinnate, about six inches long. *Pinnæ* from six to seven pair, opposite. *Leaflets* from ten to twenty pair, sessile, opposite, linear, smooth; about four lines long, and one in breadth. *Petioles* common, grooved on the upper side, smooth, and without glands. *Stipules* minute, subulate. *Racemes* terminal, corymbiform, simple, few-flowered. *Flowers* large, very gaudy, inodorous, yellow. *Bractes* small, one-flowered, caducous. *Calyx* divided to its fleshy base, into five, equal, lanceolate segments, which are villous on the inside. *Petals* five, inserted on the fleshy base of the calyx, of which the upper one is smaller, and deeper coloured, all nearly round, and much curled round the edge. *Filaments* ten, equal, ascending, afterwards recurved, twice the length of the petals, thick and villous at the base, inserted on the calyx, within the petals. *Anthers* incumbent. *Germ* sessile, linear, villous, one-celled, with from fifteen to twenty *ovula* attached to the upper suture. *Style* as long as the filaments, for some time after the flower expands modestly recurved from the filaments, which have then a different direction, afterwards ascending, when the filaments become declinate. *Stigma* small, turbinate.

CAESALPINIA. Schreb. gen. n. 703.

Calyx, base permanent; *border* five-parted, and deciduous. *Corol* irregular, five-petalled,
II. the upper one smaller. *Filaments* woolly. *Anthers* all the ten fertile, and open on their sides.
357 1. C. *Sappan. Willd.* 2. 533. *R. Corom. pl.* 1. *p.* 17. *t.* 16.

Arboreous, armed. *Leaves* bipinnate; *pinnæ* from ten to twelve pair; *leaflets* from ten to twelve pair, somewhat dolabriform. *Panicles* terminal. *Legumes* ligneous sub-trapeziform, from three to four-seeded.

Lignum sappan. *Rumph. Amb.* 4. *t.* 21.

Sans. Patanga.

Teling. Beng. and *Hind.* Bukkum. This is also said to be the Arabic and Persian name.

Tjsam-pangam. *Hort. Mal.* 6. *t.* 2.

Found in most parts of India, and its islands. It flowers in the hot season.

2. C. *Bonduccella. R. Fleming in Asiat. Res.* 11. 159.

Scandent, armed. *Leaves* bipinnate; *pinnæ* seven pair; *leaflets* eight pairs, ovate-oblong. *Stipules* large, and pinnatifid. *Bractes* lanceolate, reflected. *Racemes* simple, above the axils. *Legumes* armed, two-seeded.

Puticaraja. *Asiat. Res.* 2. *p.* 351; *also* 4. *p.* 276. *and* 11. 159.

Guilandina *bonduccella. Linn. Lamarck*, &c.

Globuli *majores. Rumph. Amb.* 5. *t.* 49. *f.* 1.

Caretti. *Rheed. Mal.* 2. *t.* 22.

Beng. Nata.

Hind. Katkarunja, Katkulija.

The plants reared from seed from the West Indies, proved to be exactly the same. The seed is a powerful tonic.

3. C. *oleosperma. R.*

Scandent, prickly. *Leaves* bipinnate; *pinnæ* and *leaflets* eight paired. *Stipules* subulate. *Legumes* unarmed, from two to three-seeded, and swelled at the seeds.

Beng. Umul-koochi.

II. *Teling.* Noonee glika. *Noonee* means oil, oily.
358 This seems to me to be an undescribed species, has much the habit of *Bonduccella.* It flowers during the wet season. The seeds ripen in March and April.

Stem and *branches* climbing, woody, armed with many small, sharp, recurved prickles. *Leaves* alternate, abruptly-bipinnate, oblong, from eight to nine inches long, and about four broad. *Pinnæ* opposite, seven, eight, or nine pairs. *Leaflets* opposite, from six to ten pair, linear-oblong, smooth, entire, about one-third of an inch long, and one-fifth broad. *Petioles* common, are frequently armed with some, small, scattered prickles, and there is generally a pair below each pair of pinnæ. *Stipules* subulate. *Racemes* rather above the axils, simple, somewhat shorter than the leaves. *Pedicels* diverging, about an inch and a half long. *Flowers* many, pretty large, yellow. *Petals* orbicular, the lower end smallest, and striated with red. *Filaments* woolly, alternately shorter. *Legume* smooth, oblong, obliquely-jointed, very protuberant at the seeds; about two and a half inches long, and one broad. *Seeds* two or three, oval, smooth, shining, hard, about the size of a large pea. Page Carey Ed.

From the seeds, an oil is expressed, in some part of the country, which is used to burn in lamps.

4. C. *cucullata. R.*

Scandent, armed. *Leaves* bipinnate; *pinnæ* from four to six pair; *leaflets* from four to five pair, ovate, polished. *Panicles* terminal, and axillary, thin. Upper petal two-lobed and vaulted. *Legume* thin, smooth, membrane margined on the back, one or two-seeded.

A native of the Delta of the Ganges where it was found by Dr. William Carey, and by him introduced into the Botanic garden at Calcutta where it blossoms in February and March.

Trunk ligneous, stout, scandent, which together with the scandent branches are armed with numerous, strong, very sharp, dark-coloured, recurved prickles, which by age acquire a large conic base. *Bark* smooth, and polished in the young shoots. *Leaves* bipinnate, from one to two feet long. *Pinnæ* opposite, from three or four to six or seven pair. *Leaflets* generally four or five pair, opposite, ovate, entire, taper-pointed, firm, and polished on both sides, from one to three inches long. *Petioles* common and partial, round, smooth, and armed with recurved prickles. *Stipules* minute, falling long before the leaves are full grown. *Panicles* axillary, and terminal, composed of a few simple, ascending, rigid racemes. *Bractes* small caducous. *Flowers* numerous, solitary, drooping, greenish yellow. *Calyx* as in the genus, yellow, and smooth, size of the corol. *Color* greenish, the upper petals two-lobed, the *lobes* large, and at all periods folded down like an arch, over the base, and the insertion of the stamina and pistil; lateral pairs nearly round, at first greenish, becoming yellow by exposure to the air and light. *Filaments* scarcely downy at the base, much longer than the corol. *Germ* short-pedicelled. *Stigma* obliquely funnel-shaped. *Legume* linear-oblong, thin, pointed and often twisted near the apex, smooth and unarmed, a thin membranaceous, scariose wing runs along the whole length of the back. *Seeds* one or two, smooth, light brown. II. 359

5. C. *Simora. Buch.*

Scandent, armed, the tender parts coloured and glandular. *Leaves* bipinnate; *pinnæ* from twelve to twenty-four pairs; *leaflets* from eight to sixteen pair. *Stipules* ensiform. *Racemes* simple, leaf-opposed and terminal. *Legume* dolabriform, turgid, two-seeded.

A native of Mysore, from thence Dr. Buchanan sent seeds to the Botanic garden at Calcutta where the plants grow luxuriantly, and blossom during the cold season; the seeds ripen four or five months afterwards. *Stem* and larger *branches* stout, and ligneous, climbing over trees to a considerable extent. *Bark* brown, and armed with very sharp, straight prickles; *young shoots* of a bright reddish colour, armed, glandular, and somewhat hairy. *Leaves* alternate, bipinnate, from one to three feet long. *Pinnæ* from twelve to thirty pairs, opposite, about two inches long. *Leaflets* from eight to sixteen pair, opposite, linear-oblong, smooth, entire; nearly half an inch long. *Petioles* common, nearly round, armed, and chiefly with three larger prickles at or near the insertion of the partial petioles, two of them below, and recurved; one above, and incurved. *Partial petioles* also armed. *Stipules* ensiform. *Racemes* nearly opposite to the leaves, and sometimes terminal, single, and simple, very long. *Peduncles* armed near the base; the rest and the diverging long pedicels dotted with many, clammy dark-coloured glands, interspersed with a few hairs. *Bractes* solitary, one-flowered, at the base ovate-cordate with subulate apices, caducous. *Flowers* solitary, pretty large, colour a bright yellow. *Legumes* turgid, of an irregular kidney-shape; acuminate, somewhat hairy; more than an inch and a half long, and about one inch broad near the apex. *Seeds* two, oblong, smooth, of a shining dark brown. *Embryo* without perisperm. *Cotyledons* two. *Radicle* directed to the umbilicus. II. 360

6. C. *sepiaria. R.*

Scandent, prickly. *Leaves* bipinnate; *pinnæ* eight pair; *leaflets* ten pair, linear oblong. *Stipules* semisagittate. *Racemes* axillary. *Calyces* coloured. *Legume* unarmed, daggered, six-seeded.

The Mysore thorn, was introduced into Bengal from that country by General Martin, where it is now as common as it is in the Mysore country, and is used to make fences. Flowering time in Bengal the cold season.

Trunk and *branches* stout, and ligneous, spreading, or climbing to a considerable extent, if not checked; all armed with strong, sharp prickles. *Leaves* alternate, bipinnate, from ten to eighteen inches long. *Pinnæ* opposite, generally from six to ten pair, from one to four inches long. *Leaflets* opposite, from eight to twelve pair, subsessile, linear-oblong, rounded at both ends, smooth on both sides, about three-fourths of an inch long and one quarter broad. *Petioles* common, armed in the same manner with minute prickles. *Stipules* caducous, of a broad, waved, sub-semi-sagittate form. *Racemes* axillary, solitary, nodding, from the weight of the great number of large, beautiful, yellow flowers. *Peduncles* armed, and having often a small leaf or two below the flowers. *Bractes* solitary, ovate-lanceolate, caducous, one-flowered. II. 361

Page Carey Ed. *Calyx* with the divisions reflexed, coloured like the corol, and about half the size thereof. *Corol*, the two pairs of lateral petals equal, nearly round; the upper one much smaller, with a longer claw, all of a bright yellow colour. *Filaments* woolly below the middle, about as long as the larger petals, and with them inserted on the permanent base of the calyx. *Germ* oblong, villous. *Style* as long as the stamens. *Stigma* simple, perforated. *Legume* linear-oblong smooth, with a long subulate point. *Seeds* from four to eight, obovate, oblong, smooth, dark coloured, variegated, the size of a large pea.

This, when in full blossom, is ornamental and well deserving a place in the gardens of all such as are fond of showy productions. It also makes an excellent fence, and as such was much employed by Hyder-Alli in the bound-hedges of his forts, and other strong holds.

7. C. *chinensis. R.*

Scandent, armed. *Leaves* bipinnate; *pinnæ* and *leaflets* from two to four pairs, the latter oval and oblong, both ends obtuse lucid. *Petioles* and *petiolets* armed.

Introduced from China, into the Botanic garden at Calcutta, where it has now been for
II. these five or six years and has not yet blossomed.

362 8. C. *bonduc. R.*

Scandent, armed. *Leaves* bipinnate. *Pinnæ* from four to eight pair; *leaflets* from six to seven pair, oval, lucid, mucronate.

Guilandina bonduc. *Willd.* 2. 534.

From Sumatra this very large species has been introduced into the Botanic garden at Calcutta without having blossomed, though in perfect health, and of great extent.

9. C. *resupinata. R.*

Arboreous, subscandent, armed. *Leaves* bipinnate; *pinnæ*, and *leaflets* many-paired; common petiole armed on the underside. *Stipules* minute, caducous. *Racemes* axillary. *Flowers* resupine. *Legume* two-seeded.

A native of the Moluccas, and reared in the Botanic garden at Calcutta from seed received from those islands in 1798. It blossomed for the first time in the month of September, 1800, and ripened its seeds the March following.

Trunk tolerably erect, though rather too weak to support itself at its present age, every part thickly armed with numerous, short, very sharp prickles. *Branches* numerous, some scandent, some spreading or drooping; height of the whole plant at present about twelve feet. *Leaves* alternate, bipinnate, from six to twelve inches long. *Pinnæ* about twelve pair, opposite, from one to two inches long. *Leaflets* opposite, from eight to twelve pair, obliquely oval, entire, smooth on both sides; about one-third of an inch long. *Petioles* common, round, villous, armed with recurved prickles between the pinnæ on the under side, and a gland between each pair on the upper. *Stipules* filiform, very small, caducous. *Racemes* axillary,
II. solitary, and generally simple, spreading, shorter than the leaves. *Pedicels* solitary, one-flow-
363 ered, round, smooth, slender, about an inch long. *Flowers* resupine, numerous, bright yellow, and though not small, they are more so than any other Indian species of this genus I have yet met with. *Bracles* most minute, one-flowered. *Calyx* smooth, coloured on the inside; lower division of the border much larger than the rest; the base only permanent. *Corol* the two lateral pair of petals nearly equal, roundish, expanding, short-clawed. The superior one smaller, ovate-cuneate, with a curled margin, and on the centre a tuft of wool, coloured with reddish veins. *Legumes* oblong, thick, fleshy on the margin, protuberant where the seeds are lodged. *Seeds* from one to three, round, smooth, brown, size of a marrow-fat pea.

10. C. *enneaphylla. R.*

Shrubby, scandent, armed. *Leaves* bipinnate. *Pinnæ* and *leaflets* from eight to ten-paired. *Panicles* terminal. *Legume* unarmed, winged on the back, five-seeded.

A native of the eastern parts of Bengal, where it blossoms about the beginning of the cold season. *Trunk* and larger branches stout, ligneous, climbing up and over large trees, and whatever else they meet with, armed with numerous, curved, sharp, black prickles, each inserted over the old woody parts, on a large, transversely oblong, subsolid tuberosity. *Bark* of the young shoots smooth, shining, deep green, armed with numerous smooth, sharp prickles. *Leaves* alternate, bipinnate, from nine to ten inches long. *Pinnæ* opposite, generally eight, nine, or ten pairs. *Leaflets* from eight to ten pairs, cuneate-oblong, rounded at both ends, entire, smooth on both sides; from half an inch to one inch long. *Petioles* common, armed underneath; with many, recurved, sharp prickles; a pair of which is always placed at the insertion of the pinnæ, and sometimes a single straight one on the upper side between them. *Stipules*
II. scarcely any. *Panicles* terminal, composed of many large, ascending racemes, of numerous,
364 beautiful yellow fragrant flowers. *Calyx* of five, subequal coloured, reflected, caducous divisions inserted on a permanent base. *Corol* papilionaceous; the upper three petals placed on the upper side resembling the banner, the lower pair resembling the wings, while the lower division of the perianth before it becomes quite reflected is not unlike the keel. *Filaments* ten, declined, woolly, alternately shorter. *Anthers* incumbent, brown. *Pistil* hid amongst the stamens. *Legume* unarmed, smooth; broad-lanceolate, thin on the back, enlarged by a membranous wing which is united by an elevated suture. *Seeds* five or six, oval, smooth, flattened.

11. C. *paniculata. R.*

Scandent, armed. *Leaves* bipinnate; *pinnæ* and *leaflets* three or four-paired. *Stipules* minute. *Panicles* terminal. *Legumes* obliquely oval, smooth, cuspidate, one-seeded.

Kaku-mullu. *Rheed. Mal.* 6. *t.* 19.

Guilandina *paniculata. Willd.* 2. 535. *Lamarck. Encycl.* 1. *p.* 430.

A native of various parts of India. It blossoms during the dry months of February and March. The seeds ripen in August and September.

Stem and *branches* ligneous, climbing up and over trees, &c. *Bark* smooth and green until the plants are several years old; every part armed with dreadfully sharp, strong, recurved chesnut coloured aculei which acquire an immense base like the point of the finger on the trunk and large branches of old plants. *Leaves* bipinnate, from six to twelve inches long. *Pinnæ* three or four pair, remote. *Leaflets* three pair, ovate-lanceolate, obtuse, entire, of a firm texture, polished on both sides, from one to two inches long. *Petioles* common and partial, armed on the underside, smooth, round, generally coloured on the upperside. *Stipules* very minute and soon falling off. *Inflorescence*, generally one terminal panicle, or compound raceme, and one or two simple, single racemes from the axils next the panicle. *Bractes* ovate-lanceolate, but dropping long before the flowers expand. *Flowers* numerous, pretty large, yellow and fragrant. *Legume* obliquely oval, smooth, compressed, cuspidate. *Seed* solitary. Page Carey Ed. II. 365

12. C. *tortuosa*. *R.*

Armed, subarboreous, with a long, weak, straggling trunk, and branches. *Leaves* bipinnate; *pinnæ* and *leaflets* numerous; common petiole armed. *Racemes* axillary. *Legume* from three to four-seeded, twisted, and contracted between the seeds.

This dreadfully armed species is a native of the Island of Sumatra. From thence the seeds were sent by Dr. Campbell, to the Botanic garden at Calcutta, in 1796. Now, October 1800, the trees are about fifteen feet high, with weak, slender trunks, and few still weaker subscandent branches, armed with numerous very sharp somewhat incurved, subulate prickles. It blossoms in October and the seeds are ripe in February.

Leaves bipinnate, a foot or more long. *Pinnæ* from fifteen to twenty pair, opposite. *Leaflets* from twenty to forty pairs, opposite, tapering from the base to an obtuse point, smooth, firm, and shining, about half an inch long, and one-eighth of an inch broad. *Petioles* common, keeled on the upperside, and armed with small recurved prickles underneath. *Racemes* axillary, erect, solitary, generally simple, subcylindric, rather longer than the leaves. *Flowers* scattered, very numerous, large, yellow, slightly streaked with red near the base of the petals. *Bractes* minute, caducous. *Calyx* here the lower division is uncommonly large. *Corol* the two pairs of lateral petals nearly equal, and almost round, the upper one much smaller, deeply emarginate, coloured, having a long claw. *Filaments* woolly, alternately smaller and shorter. *Legume* linear-oblong, swelled at the seeds, considerably twisted. *Seeds* from two to five, hard, smooth, of a dark blackish brown, size of a large pea. II. 366

13. C. *Sumatrana*. *R.*

Scandent, armed. *Leaves* bipinnate, no stipules; *petioles* armed on the under side. *Racemes* cauline, axillary, or terminal. *Calyx* cylindric, confining the petals. *Filaments* naked. *Legume* winged on the back.

Introduced into the Botanic garden at Calcutta from Sumatra where it is held in as much dread as the *Kantuffu* is in Abyssinia.

Trunk scarcely any, but many stout, woody branches climbling up and over trees to a great extent. These are covered with dark brown *bark*, and armed with numerous, strong, sharp, recurved prickles, the largest of them are generally in stipulary pairs. *Leaves* alternate, bipinnate, from one to two feet long. *Pinnæ* from three to six pair, opposite. *Leaflets* from six to twelve, short petioletted, alternate, oval, entire, smooth on both sides, from one to two inches long. *Petioles* common, and of the *pinnæ* armed on the underside with sharp, recurved prickles otherwise smooth and polished like every other young part of the plant. *Stipules* none, but a brown smooth gland in their place. *Racemes* very large, compound, or simple, from the naked ligneous branches, or from the axils, or they are terminal. *Flowers* numerous, drooping, pretty large, of an orange colour tinged with pink. *Bractes* minute, caducous, large before the flowers expand. *Calyx* subcylindric, the inferior division a little longer, base permanent. *Petals* subclavate, the superior one rather larger and more beautifully coloured, all are only a little longer than the calyx and inserted with the stamina a little above its base. In this species the great length of the calyx prevents the petals from expanding. *Filaments* ten, alternately a little shorter, ascending, smooth. *Anthers* ovate, two-lobed. *Germ* obliquely ovate. *Style* the length of the stamina. *Stigma* simple. *Legume* oblong, thin, with a broad membranaceous margin along the upper edge, this wing is about one-third the breadth of the whole and united to the seed-bearing body of the legume by a suture which is somewhat elevated like the nerve of a leaf. *Seeds* from one to three or four, small, ovate, compressed, coloured and smooth. II. 367

14. C. *inermis*. *R.*

Unarmed. *Leaves* bipinnate; *pinnæ* as far as ten pair; *leaflets* as far as twenty. *Panicles* terminal, ferruginous. *Petals* base of the filaments, and germ very woolly.

A native of the Moluccas. The legume not seen.

15. C. *lacerans*. *R.*

Shrubby, scandent, dreadfully armed. *Leaves* bipinnate. *Calyces* coloured like the corol. *Legumes* unarmed, winged, one-seeded.

Teling. Walekadooda. A large climbing species, most completely armed. It is common in wild, woody, uncultivated places, and flowers during the first part of the wet season.

Stem and longer *branches* climbing, woody, covered with scabrous, ash-coloured *bark*: the smaller *branches* less so, and armed with innumerable, large, strong, sharp, recurved prickles; the tender shoots purple. *Leaves* alternate, abruptly bipinnate, from five to six inches long and three broad. *Pinnæ* opposite, from four to eight pair. *Leaflets* opposite, from four to eight pair, oval, entire, smooth, half an inch long and a quarter of an inch broad. *Petioles* common, smooth, armed with a pair of recurved prickles below each pair of pinnæ, and a single erect one opposite to them on the upper side. *Racemes* axillary, and only from the extreme leaves, which

368 gives them the appearance of a large terminal leafly panicle. *Flowers* middle sized, numerous, white, beautifully tinged with red. *Calyx* coloured, as large as the corol.

HYPERANTHERA. Vahl.

Calyx five-cleft. *Corol* irregular, five-petalled. *Stamina* unequal. *Capsule* superior, one-celled, three-valved. *Seeds* winged.

H. *moringa. Willd.* 2. 536. *Asiat. Res.* 11. 168.

Arboreous. *Leaves* supradecompound. Half the stamina sterile.

Guilendina *Moringa. Linn. Jacq. &c.*

Anoma Moringa. *Lourier. Cochin Ch.* 343-4.

Mouringou. *Rheed. Mal.* 6. *f.* 11.

Sobhanjana. *Asiat. Res.* 4. *p.* 277.

Beng. Sujuna.

Tam. and *Teling.* Morunga.

Common in a cultivated state all over India. The leaves, flowers, and tender seed-vessels, are eaten by the natives in their curries.

A red flowered species, or variety is found in the vicinity of Malda, its Sanscrit name *Mudhoo-shigroo.*

GÆRTNERA. R.

Calyx five-leaved. *Corol* irregular. *Petals* five, reflexed. *Germ* three-celled, cells one-seeded, attachment subsuperior. *Capsules* three, superior, each three-winged, and one-seeded. *Embryo* inverse, without perisperm.

1. G. *racemosa. Willd.* 2. 551. *R. Corom. pl.* 1. *p.* 19. *t.* 18.

Leaves ovate-oblong, acute. Two exterior petals oblong.

Antimucta. *Asiat. Res.* 4. *p.* 282.

Banisteria *Bengalensis. Linn. sp. pl.* 611.

II. Madab lota. *Sonnerat. N.* 2. *p.* 238. *t.* 135.

369 Molina racemosa. Lamarck. *Encyclop.* 4. 227. *and Cavan. Diss.* 9. *t.* 263.

Sida-pou. *Rheed. Mal.* 6. *t.* 59.

Teling. Vedal-tshittu.

Beng. Madhuva-luta, or Madhubuluta, also Mal tee.

Found in various parts of India. It flowers during the rainy and cold season. The blossoms are uncommonly beautiful, and exceedingly fragrant.

2. G. *obtusifolia. R.*

Leaves oblong, obtuse. All the petals round, the lower two expanded, the upper three reflex.

A native of China, and from thence brought to the Botanic garden at Calcutta, prior to 1793. Like *racemosa*, it is a large, scandent, somewhat twining shrub ; running over trees of considerable size. Flowering time the month of March. Its blossoms are smaller, less beautiful, and not so fragrant, as those of *G. racemosa.*

Flowers of five petals, the lower two, more expanded, the upper three completely reflexed, all elegantly fringed round the margins, the uppermost one has a rosy tinge round a yellowish base where two curved hornlets project in toward the stamina, the other four are white. *Filaments* unequal, ascending in a beautiful curve ; the lower one much larger, and longer. *Germ* superior, three-lobed, each lobe crowned with one larger, and two smaller, semilunar, hairy processes, which in the fertile lobes become wings; each lobe contains a single seed attached to the inner and upper angle of the cell. *Style* ascending, nearly as long as the long filament. *Stigma* simple, incurved. *Samara,* rarely more than one of the three come to maturity, globose, villous, and of a soft chaffy texture, three-winged ; *wings* lanceolate, scariose, one of them larger, between it and the base is a small scar, the mark of the attachment of the style.

II. *Seed* single, round. *Integument* single, tender, brown, attached to the samara under the
370 remains of the style. *Perisperm* none. *Embryo* inverse, yellowish. *Cotyledons* conform to the seed, unequal, and sometimes divided. *Plumula* two-lobed. *Radicles* oval, curved up, and pointing to the vertex of the seed.

ADENANTHERA. Schreb. gen. n. 707.

Calyx five-toothed. *Corol* five-petalled ; a globular gland crowns the apex of each anther.

1. A. *pavonina. Willd.* 2. 550.

Unarmed. *Leaves* bipinnate ; *leaflets* smooth. *Racemes* axillary.

Sans. Koochunduna.

Beng. Ructa-chundan, Runjuna, which means red sandal, whereas we consider *Pterocarpus Santalinus* to be the tree which yields that wood.

Mandsjadi. *Rheed. Mal.* 6. *t.* 14.

Corollaria parvifolia. *Rumph. Amb.* 3. *t.* 109.

Found in various forests over most parts of India. It grows to be a very large tree with an erect trunk, and when old, dark-coloured scabrous bark ; while young, smooth. The interior wood of large trees is of a deep red colour, very hard and durable.

Leaves alternate, abruptly bipinnate, from one to three feet long. *Pinnæ* opposite, generally from four to six pair, each from four to twelve inches long. *Leaflets* alternate, short-

petioletted, from four to ten or twelve pair, oval, with the margins waved, smooth on both sides, from one to two inches long. *Petioles* round, smooth, coloured. *Racemes* terminal and from the exterior axils, solitary, cylindric, about a span long. *Flowers* numerous, small, yellow, fragrant. *Bractes* minute and caducous. *Calyx*, &c. parts of fructification as in the genus, only the petals adhere slightly at the base, and there the filaments are inserted. Page Carey Ed. II. 371

The coloured wood of this tree is used for a variety of economical purposes. The smooth, oval, bright scarlet coloured, hard seeds are strung on a thread and worn by the women round their necks in many parts of India. The wood yields a dye, and is employed by the Brahmins after religious bathing in marking their foreheads; for which purpose it is obtained, by rubbing the wood on a wet stone.

2. A. *aculeata. R.*

Arboreous, prickly. *Leaves* bipinnate, smooth. *Legumes* cylindric, replete with a farinaceous substance, in which the seeds are found.

Prosopis *spicigera. Willd.* 2. 547. *R. Corom. pl.* 1. *N.* 63.

Somi. *Wilford in Asiat. Res.* 4. *p.* 363. Sir William Jones's *Sami of the same vol. page* 307, is very different; viz. *Mimosa farnesiana*, a plant he never intended for *Sami.*

Prosopis *aculeata. Asiat. Res.* 4. *p.* 405.

Prosopis *aculeata. Kön. Mss.*

Teling. Chanee.

This grows to the size of a tree. It is a native of most parts of the coast of Coromandel, chiefly on low lands at a considerable distance from the sea; it is also found in some parts of Hindoostan. It flowers during the cold and beginning of the hot seasons.

Trunk tolerably erect. *Bark* deeply cracked, of a dirty ash colour. *Branches* irregular, very numerous, forming a pretty large, very shady head. *Prickles* scattered over the small branches, in some trees wanting. *Leaves* alternate, generally bipinnate, from two to three inches long. *Pinnæ* from one to four, when in pairs, opposite, and having a gland between their insertions. *Leaflets* opposite, from seven to ten pair, obliquely lanceolate, smooth, entire, about half an inch long, and one-sixth broad. *Stipules* none. *Spikes* axillary, several together, filiform, nearly erect. *Bractes* minute, one-flowered, caducous. *Flowers* numerous, small, yellow, single, approximate. *Calyx* below, five-toothed. *Filaments* united at the base. *Anthers* incumbent and white, with a gland on the apex of each which falls off soon after the flower expands. *Style* crooked. *Stigma* simple. *Legume* long, pendulous, not inflated. *Seeds* many, lodged in a brown mealy substance. II. 372

The pod of this tree is the only part used; it is about an inch in circumference, and from six to twelve long; when ripe, brown and smooth, containing besides the seeds a large quantity of a brown mealy substance which the natives eat. Its taste is sweetish, and agreeable; it may therefore be compared to the Spanish *Algaroba*, or *Locust tree (Ceratonia siliqua.)*

CYNOMETRA. Linn.

Calyx four-leaved. *Corol* five-petalled. *Legume* fleshy, lunate, one-seeded. *Embryo* centripetal, no perisperm.

C. *polyandra. R.*

Leaves pinnate. *Branchlets* floriferous. *Flowers* polyandrous.

Peng is the vernacular name in Silhet, where it grows to be a very large and useful timber tree. Flowering time March and April. The seeds ripen in July and August.

PETALOMA. Schreb. gen. n. 1750.

Calyx five-toothed. *Petals* five, the stamina inserted on the calyx. *Berry* inferior, one-celled. *Seeds* from one to four.

P. *alternifolia. R.*

Leaves alternate, obovate-cuneate, emarginate. *Spikes* axillary. II. 373

Kada Kandel. *Rheed. Mal. vol.* 6. *t.* 37.

Beng. Kripa.

A pretty large tree, a native of the Delta of the Ganges, where the spring-tides rise so high as to overflow the ground on which they grow. Flowering time the hot season.

Trunk straight, *bark* scabrous. *Branches* numerous, erect, and ascending, with dark brown, smooth, *bark*. *Leaves* alternate, subsessile, obovate, emarginate, slightly crenate, almost veinless, smooth on both sides, and fleshy, about two inches long, and one broad. *Stipules* none. *Spikes* axillary, solitary, generally simple, about as long as the leaves, each bearing from six to twelve, alternate, small, white flowers. *Bractes*, a very minute one at the base of each germ, and two growing on the opposite sides of its middle. *Calyx* five-toothed; *teeth* rounded and frequently unequal. *Petals* five, inserted within the fissures of the calyx, oblong, entire, first expanding, then recurved. *Filaments* ten, alternately a little longer, about the length of the petals. *Anthers* ovate. *Germ* inferior, ovate, compressed. *Style* awled, as long as the *stamens*. *Stigma* acute. *Pericarpium* a small ovate, oblong, compressed, drupaceous berry, with a single linear, oblong seed.

The wood is remarkably strong and durable; it is much used for posts and other parts of the houses of the natives, but its chief consumption about Calcutta is for fuel, large quantities being brought daily from the Sunderbunds (low parts of the Delta,) for that purpose.

I doubt if this can with propriety be considered a *Petaloma*. The habit does not by any means agree. It will probably form a genus.

Page Carey Ed.

RUTA. Schreb. gen. n. 725.

Calyx five-parted. *Petals* concave. *Receptacle* of the germ impressed with ten melliferous pits. *Capsule* lobate.

II. 374 R. *graveolens. Willd.* 2. 542.

Leaves supra-decompound; *leaflets* oblong, the terminal ones obovate. *Petals* entire.

Arab. Sudal.

Sans. Somalata, also Brahmee.

Hind. Saturi, also Arooda.

It is I presume a native of Persia, and the western parts of Asia. In Bengal, it is found in gardens only where it flowers during the cold season.

MURRAYA. Schreb. gen. n. 717.

Calyx five-toothed. *Corol* campanulate, five-petalled. *Germ* two-celled, with two subpendulous ovula in each, attached to the top of the axis. *Berry* superior, two-celled. *Seeds* solitary, woody. *Embryo* inverse without perisperm.

1. M. *exotica. Mant.* 393. *Willd.* 2. *p.* 518.

Leaves alternately pinnate; *leaflets* from five to seven, obliquely obovate, oblong. *Corymbs* terminal, globular, crowded.

Chalcas *paniculata. Mant.* 68.

Camunium Sinense. Rumph. Amb. 5. *t.* 18. *f.* 2.

Marsana *buxifolia.* Sonnerat it. 3. 192. *t.* 139.

Teling. Naga golunga.

It grows to be a small tree, though in general found in the state of a large, erect, very ramous shrub, with a light ash-coloured *bark*. It was brought from China to this coast many years ago, where it continues to be cultivated in gardens; but I have found it very common wild, amongst the mountains in the Circars. It is from the wild plant I take my description. It flowers chiefly during the hot season.

II. 375 *Leaves* scattered, pinnate with an odd one. *Leaflets* generally three pair, alternate, obovate-oblong, emarginate, smooth, of a shining deep green, from one and a half to two inches long, and about one broad, the inferior smallest. *Petioles* glandular, round. *Corymbs* terminal, globular, crowded with pretty large, beautiful, pure white, exquisitely fragrant flowers. *Calyx* one-leaved, five-parted, glandular, divisions erect, acute. *Corol* five-petalled, campanulate. *Petals* lanceolate, spreading at top. *Nectary* a fleshy ring surrounding the base of the germ. *Filaments* ten, alternately longer, and larger. *Anthers* oblong. *Germ* superior, oblong, glandular, two-celled, with two *ovula* in each vertically attached to the upper half of the partition. *Style* thick, length of the stamens. *Stigma* large, glandular. *Seeds* one, or two, oblong, pointed above, flat on one side, woolly. *Embryo* inverse, and without perisperm.

2. M. *Sumatrana. R.*

Leaves alternately pinnate; *leaflets* from five to seven, ovate and ovate-oblong, emarginate. *Flowers* terminal.

A large shrub, a native of Sumatra, and from thence sent to the Botanic garden at Calcutta, by Dr. C. Campbell, under the name *Chalcas*; it is much thinner of branches, has larger leaves, and fewer but much larger flowers, than *exotica*, and when growing together most conspicuously different in habit. Flowers, and ripens its seed at various times through the year.

BERGERA. Schreb. gen. n. 718.

Calyx five-toothed. *Corol* five-petalled, expanding. *Germ* two-celled, one ovula in each attached to the axis. *Berry* superior, one or two-seeded. *Embryo* inverse, without perisperm.

1. B. *Königii. Willd.* 2. 549.

II. 376 *Leaflets* obliquely lanceolate, serrate.

Beng. Bursunga.

Teling. Kari-Vepa.

Tam. Kamwepila.

This grows to be a small tree. Is a native of the mountainous parts of the Coast, and is also cultivated in gardens for the sake of its leaves; they being a principal ingredient in the country stews called curries. Its flowering time is the hot season.

This tree is so well described by the late Dr. König, in the *genera* and *species* plantarum of Linnæus, that it is unnecessary for me to say any thing on that head.

The leaves, as observed above, are a very principal ingredient in curries; and when they cannot be had fresh, are used dry, for they retain their flavour very well in that state, and are to be had in every market. They have a peculiar flavour, which I cannot describe; at first it is rather disagreeable, but most people soon become perfectly reconciled to, if not fond of it.

The bark and root are used as stimulants by the native physicians. Externally they are also used to cure eruptions and the bites of poisonous animals.

The green leaves are described to be eaten raw for the cure of dysentery; they are also bruised and applied externally to cure eruptions.

2. B. *integerrima. Buch.*

Arborcous. *Leaflets* entire, with long taper points.

Ban kooncha of the natives of the eastern banks of the mouth of the Megna, where the tree grows. It was introduced into the Botanic garden by Dr. Buchanan in 1797; now, January 1800, they have advanced to the size of small ramous trees, and are at present in blossom. Page Carey Ed.

Leaves alternate, petioled, pinnate, with single terminal *leaflets*, from six to eighteen inches long. *Leaflets* opposite or subalternate, short-petioletted, obliquely lanceolate, oblong, waved, ending in long, fine, tapering points, tolerably smooth above, and somewhat villous underneath, differing in size, the exterior or largest above six inches long and two broad. *Petiolets* and *petioles* round, and a little villous. *Corymbs* terminal, decompound, large, ramifications villous. *Flowers* short-pedicelled, erect, numerous, white, emitting a strong, heavy, offensive smell. *Bractes* very minute. *Perianth* five-toothed. *Petals* five, lanceolate, expanding. *Stamens* alternately longer. *Germ* superior, oval, resting on a fleshy receptacle. *Style* clavate. *Stigma* subrotund. *Berry* the size of a large pea, oval, when ripe yellow. *Seed* solitary, nearly as large as the berry. II. 377

LIMONIA. Schreb. gen. n. 720.

Calyx four or five-toothed. *Corol* four or five-petalled. *Germ* from two to five-celled; *cells* from one to two seeded, attachment interior. *Berry* superior, few-seeded. *Embryo* inverse, without perisperm.

1. L. *bilocularis. R.*

Shrubby, armed. *Leaves* elliptic, emarginate, glossy. *Flowers* axillary, and terminal, subsessile, decandrous. *Germ* and *berries* two-seeded.

A very ramous, well armed, rigid shrub, very like *Limonia monophylla*, but always smaller; a native of Coromandel. Flowers in June; the seed ripens in September.

Spines axillary, solitary, long, strong and sharp. *Leaves* alternate, short-petioled, reflexed, elliptic, somewhat crenulate, emarginate, firm and glossy, abounding in minute cells, and odorous like the leaves of the orange, &c. when bruised; about an inch and a half long, and three quarters of an inch broad. *Stipules* axillary, solitary, by the base of the spines, subulate. *Flowers* axillary and terminal, in little, subsessile clusters, small, pure white. *Bractes* minute, subulate. *Calyx* cup-shaped, five-toothed. *Petals* five, oblong. *Nectary* a crenulate, white fleshy cup, round the lower half of the germ. *Filaments* ten, alternately shorter, lanceolar, thick, and distinct, inserted between the nectary and petals. *Anthers* ovate. *Germ* superior, two, very rarely three-lobed; two, rarely three-celled with one ovula in each, attached to the middle of the partitions; *style* short and thick. *Stigma* large, nearly round, and clammy. *Berries* spherical, of the size and appearance of a ripe *sloe*, succulent, two-celled. *Seed* solitary. *Integument* single, thin, and clear. *Perisperm* none. *Embryo* inverse, green. *Cotyledons* conform to the seed. II? 378

2. L. *monophylla. Willd.* 2. 571. *Corom. pl.* 1. *N.* 83.

Shrubby, armed with straight spines. *Leaves* simple. *Nectary* campanulate, antheriferous.

Trichilia *spinosa. Willd.* 1. 2. *p.* 554.

Limonia *pumila. Burm. zeyl.* 143. *t.* 65.

Mal-Naregam. *Rheed. Mal.* 4. *t.* 12.

Teling. Adivi-nima, *(wild lime.)*

This plant is a native of our large, extensive forests over the Coast of Coromandel, where it often grows to be a small tree, though oftener found in the state of a large shrub. Flowering time about the rainy season.

Trunk irregular. *Bark* pretty smooth, of a greenish ash colour. *Branches* numerous, very irregular, and very rigid. *Thorns* single, axillary, very strong and sharp; in some plants entirely wanting. *Leaves* alternate, short-petioled, oblong, emarginate, smooth, firm, two or three inches long, and one or one and a half broad. *Stipules* subulate. *Racemes* axillary, short. *Bractes* subulate, small. *Calyx* from four to five-parted, permanent. *Corol* four or five-petalled; *petals* equal, oblong, expanding. *Nectary* cylindric, *mouth* ten-toothed; *teeth* alternately larger. *Filaments* none; *anthers* resting on the teeth of the nectary. *Germ* superior, globular, generally four-celled, with two *ovula* in each, attached to the axis. *Style* length of the nectary. *Stigma* three or four-lobed. *Berry* the size of a nutmeg, very much like a lime (hence the Telinga name, *wild* lime) generally four-celled. *Seeds* generally solitary, that is one in each cell. II. 379

The flowers of the above described plant agree with those of *Melia*, *Trichilia*, *Turraea*, and *Swietenia*; their pericarps must be depended on to distinguish the genera.

3. L. *citrifolia. R.*

Shrubby; armed with recurved spines. *Leaves* simple, elliptically oval, entire, obtusely acuminate. *Flowers* axillary. *Berries* ovate, few-seeded.

A very ramous, rigid, well-armed shrub, of five or six feet in height, a native of the forests of Chittagong, and with the other armed species, well adapted for fences. Flowering time the hot season.

Young shoots polished. *Thorns* axillary, solitary, short, somewhat recurved. *Leaves* alternate, round-petioled, elliptic, with an obtuse, somewhat lengthened point, entire, smooth, but marked with numerous pellucid points, as in many *Aurantiæ*; from four to five inches long, and from two to three broad. *Stipules* none. *Flowers* small, white, short-peduncled, axillary. *Bractes* minute, about the insertion of the peduncles, and on them. *Calyx* five-toothed, having its substance marked with pellucid points. *Petals* five, oblong, smooth. *Filaments* ten, distinct, short, inserted round the base of the germ. *Anthers* linear, erect. *Germ*

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ovate-oblong, five-grooved, on the outside five-celled, each cell containing two *ovula* attached to the axis. *Style* thick and short. *Stigma* sub-peltate. *Berry* ovate, of the colour and appearance of a lime, even to the little green cells in the cortex. *Seeds* from one to four, separated by some few small fibres only, which are scarcely to be traced when dry, oblong, having the sides agreeing in shape with the number in the berry. *Integument* single, membranaceous. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed. *Radicle* superior.

4. L. *scandens. R.*

Shrubby, scandent, armed. *Leaves* ternate; *leaflets* lanceolar, entire, smooth. *Berries* three-seeded.

Sans. Luvunga-luta.

Lung-phool of the natives about Silhet.

A very extensive, powerful, scandent shrub, a native of the hills about Silhet and Chittagong, where it blossoms in March and April, and the seeds ripen in September.

Trunk or branches several from the same root, long, thick, stout, ligneous, scandent, armed. *Bark* pretty smooth and ash-coloured. *Thorns* axillary, solitary, strong, long, acute, and a little recurved. *Leaves* alternate, ternate. *Leaflets* lanceolate, entire, smooth, shining and firm, from six to seven inches long, having both surfaces marked with minute, dark green, glandular dots, or cells, though the smell, as in most leaves of this conformation, has nothing particular in it; when the plants are young, the leaves are simple. *Petioles* channelled, smooth, deep green like the leaves. *Peduncles* axillary, or from the naked branchlets below the leaves, each supporting from four to twelve, pedicelled, pretty large, white, fragrant flowers, in form of a raceme. *Calyx* one-leaved, cylindric, with the *mouth* cut into four short, truncate divisions. *Petals* four, linear oblong, fleshy, recurved. *Filaments* eight; the lower half united into a firm, fleshy tube. *Anthers* linear, incumbent. *Germ* conical, elevated on a fleshy receptacle, three-celled with two vertical *ovula* in each, attached to the axis. *Style* cylindric. *Stigma* entire, roundish. *Berry* oblong, somewhat three-lobed, size of a pigeon's egg, pretty smooth,

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pulp of a resinous nature, and odoriferous, three-celled. *Seed* solitary, oval, somewhat pointed at the apex, covered with a single greenish-veined integument. *Perisperm* none. *Embryo* conform to the seed, inverse. *Cotyledons* oblong green, fleshy. *Plumula* two-lobed. *Radicle* ovate, superior.

Previous to having seen the pericarpium of this plant, an incomplete description and drawing were sent to the Honourable the Court of Directors, under the name *Aitonia spinosa*. The discovery of the seed vessel, together with its structure, &c. convinces me it cannot belong to that genus, and seems to associate best with *Limonia*, *Murraya*, and *Triphasia*, and no doubt belongs to the seed, and divisions of Jussieu's natural order Aurantia.

5. L. *pentaphylla. Willd.* 1. 572. *R. Corom. pl.* 1. *p.* 60. *t.* 84.

Unarmed, shrubby. *Leaves* pinnate; *leaflets* about five, subalternate, oblong, entire, smooth. *Berries* with one or two, rarely three, perfect seeds.

Teling. Gulunga.

Beng. Ash-shoura.

A very common shrub every where, and in flower and ripe seed all the year. The small white flowers are sweetly fragrant.

6. L. *arborea. R. Corom. pl.* 1 60. *t.* 85.

Unarmed, arboreous. *Leaves* pinnate; *leaflets* about five, oblong, serrate, smooth. *Berries* with one or two perfect seeds. *Teling.* Konda Gulunga.

A native of the Circar mountains.

7. L. *crenulata. R. Corom. pl.* 1. *p.* 60. *t.* 86.

Arboreous, armed. *Leaves* pinnate; *leaflets* from two to three pair, oblong, crenulate; *petioles* winged. *Corols* four-petalled. *Berries* with from one to four cells, and one seed in

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each.

Limonia *acidissima. Mant.* 380. *Willd.* 2. 572.

Tsjerou-katou narigam. *Rheed. Mal.* 4. *t.* 14.

Teling. Torelega.

An elegant small tree, a native of Coromandel, Malabar, &c. Flowering time the hot season.

8. L. *pentagyna. R.*

Arboreous. *Leaflets* from five to nine, sublanceolate. *Racemes* axillary, compound. *Nectary* short, crenulate. *Berry* with from one to five lobes, and as many seeds.

Teling. Chitreka.

A large timber tree, a native of the Circars, Bengal, &c. and in flower during the hot season.

COOKIA. Retz.

Calyx five-toothed. *Corol* five-petalled. *Germ* elevated on a receptacle, five-celled; cell two-seeded; attachment interior. *Berry* superior, five-seeded. *Embryo* inverse, no perisperm.

1. C. *punctata. Willd.* 2558. *Sonnerat. it.* 2. 181. *t.* 130. Sonneratia *punctata. Syst.* 1. 675.

Quinaria *lansium. Lour. Cochin Ch.* 334.

Chin. Whung-pi.

A Chinese fruit tree, now common in Bengal, and various other parts of India. Flowering time the beginning of the hot season; the fruit ripe in three or four months after.

Trunk straight; *branches* numerous, suberect; *bark* pretty smooth, ash-coloured, that of the young shoots green, and scabrous. *Leaves* alternate, pinnate, with an odd one. *Leaflets* three or four pairs, nearly opposite, short-petioletted, obliquely oblong-oval, entire, of a firm texture, smooth on both sides, while the under side of the veins are scabrous. *Petioles* round, hairy, and scabrous. *Stipules* none. *Panicles* terminal, large, erect, composed of many, suberect, compound racemes, covered with rough, glandular excrescences. *Flowers* numerous, small, white. *Bractes* small, falling. *Calyx* inferior, cup-shaped, five-toothed, outside glandular. *Petals* five, lanceolato-oblong, spreading, concave. *Filaments* ten, rather shorter than the petals, recurved, inserted with broad bases round the bottom of the receptacle. *Anthers* roundish, incumbent. *Germ* superior, short-pedicelled, five-celled with two *ovula* in each, attached to the thickened middle of the axis. *Style* short, and thick. *Stigma* of five obtuse lobes. *Berry* the size and appearance of a gooseberry, skin tough, and replete with cells filled with a fragrant green balsam, five-celled. *Seed* solitary, oblong. *Integument* single, thin, colourless. *Perisperm* none. *Embryo* inverse, green. *Cotyledons* conform to the seed. *Plumula* conical, bidentate. *Radicle* cylindric, superior.

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The fruit, and indeed every part of the tree, possess a peculiar kind of agreeable fragrance, which is something of a Terebinthinaceous nature.

BOSWELLIA. (R.)

Calyx five-toothed. *Corol* five-petalled. *Nectary* a crenulated fleshy, staminiferous cup, surrounding the lower part of the germ. *Germ* superior, three-celled, cells two-seeded, three-valved. *Seed* solitary, membrane winged. *Embryo* inverse, folded, without perisperm.

Note. The genus is so named, in memory of the late Dr. John Boswell, Physician in Edinburgh.

1. B. *thurifera. Colebrooke in Asiat. Res.* 9. 317. *and* 11. 158.

Leaflets serrate. *Racemes* simple, axillary. *Filaments* inserted on the exterior margin of the nectary.

Canarium *hirsutum. Willd.* 4. 760. II.

Canarium *odoriferum; hirsutum. Rumph. Amb.* 2. *t.* 51. 384

Sans. Salaci the tree, and Koondooroo, the drug, or incense.

Beng. Salai the tree, and Koondooroo, or Gundhurus the drug.

Hind. Luban.

A large timber tree, a native of the mountainous parts of Coromandel, Bundelkhund, &c. Flowering time the hot season, March and April, and the seeds ripen about the end of the year. From the researches of Mr. Colebrooke, above quoted, in the 11th Vol. of the Asiatic Researches it appears that the *oblibanum* or Frankincense of the ancients is the produce of this tree, and not of *Juniperus lycia*, as hitherto thought.

2. B. *glabra. R. Corom. pl.* 3. N. 207.

Leaflets smooth, serrulate, or entire. *Racemes* terminal, subpanicled. *Filaments* inserted into the base of the nectary on the outside.

Canarium *odoriferum læve. Rumph. Amb.* 2. *t.* 50.

Canarium *balsamiferum. Willd.* 4. 760.

Teling. Googoolupoo-chittoo.

This as well as *thurifera* yields a resin, which is used as incense, and for pitch, in some parts of India. It is a native of the mountainous districts of Coromandel where it blossoms during the dry season.

BUCHANANIA. (R.)

Calyx five-toothed. *Petals* five. *Nectary* double; the exterior a crenulate cup between the filaments and germ; the inner four subulate bodies are one side within the former. *Germ* superior, one-celled, one-seeded; attachment from the bottom of the cell to the apex of the ovula. *Drupe* with a one-seeded nut. *Embryo* transverse, no perisperm. II. 385

1. B. *latifolia. R.*

Arboreous. *Leaves* oval.

Sans. and *Beng.* Piyala, the name of the tree.

Hind. Peeyar, Peeyal, Piyala.

Sans. Chirika, the name of the fruit.

Beng. Chirongi, the name of the fruit, as sold in the Bazars.

Teling. Charoo-mamudee.

Mowdo, or Kati mango-marum of the Tamuls. It must have been the Telinga and Tamul names, which induced Konig to call this tree Mangifera silvestris.

Larmzon. *Buch. in Asiat. Res.* 5. *p.* 123.

A large tree, a native of the mountainous parts of the coast. It flowers in January and February.

Trunk strait, thick, and of a great height. *Bark* scabrous. *Branches* numerous, spreading in every direction. *Leaves* alternate, though sometimes three-fold, short-petioled, oval, oblong, or obovate, obtuse, entire, of a hard texture, pretty smooth, above scabrous, below softer, six or seven inches long, and about four broad. *Stipules* none. *Panicles* terminal, and from the exterior axils, erect, branchy, conical. *Bractes* small, caducous. *Flowers* very numerous, small, of a whitish green. *Calyx* inferior, five-toothed, permanent. *Petals* five, oblong, spreading. *Nectary* double; *exterior*, a fleshy, ten-notched yellow ring surrounding the base of the

Page Carey Ed. germ; *interior*, consisting of four subulate bodies, placed on one side of the germ, and within the exterior ring; they are about as long as the whole pistil, and look like four additional styles. *Filaments* ten, equal, spreading, nearly as long as the petals, inserted into the outside of the base of the exterior nectary. *Anthers* ovate. *Germ* conical, hairy, one-celled, containing one *ovula*, attached to the bottom of the cell by a long curved cord, which takes nearly a turn
II. round the ovula, and enters it on the middle of the opposite side. *Style* subulate. *Stigma* sim-
386 ple. *Drupe* size of a cherry, a little compressed, smooth, when ripe, black. *Nut* very hard, one-celled, two-valved. *Seed* solitary covered with a double integument. *Perisperm* none. *Embryo* transverse.

The wood of this tree is used for various purposes, and the kernels are a very general substitute for almonds, amongst the natives.

2. B. *angustifolia. R.*

Arboreous. *Leaves* linear-oblong, apex rounded.

A native of the south end of the Peninsula of India. Flowers in June, and the fruit takes nearly one year to come to maturity.

3. B. *lancifolia. R.*

Arboreous. *Leaves* lanceolate, obtuse pointed, lucid, entire. *Panicles* terminal.

A large, and tall tree, a native of Chittagong. The tender, unripe fruit is eaten by the natives in their curries.

WALSURA. (R.)

Calyx five-toothed. *Corol* five-petalled. *Nectary* double; *exterior* subcylindric, bearing the anthers in its mouth; *interior* a fleshy ring round the germ. *Germ* superior, two-celled; cells two-seeded; attachment interior. *Berry* one-seeded. *Embryo* erect, no perisperm.

1. W. *robusta. R.*

Leaves quinate-pinnate; *leaflets* lanceolate. *Panicles* terminal and axillary. *Filaments* distinct, (consequently the exterior nectary is not found.)

Upphing, the vernacular name in Silhet, where it grows to be one of their largest timber
II. trees; having a trunk seven feet in circumference, and other parts in proportion.
387 It flowers in March and April, and the seed ripens in June.

Young shoots rough with scabrous specks, but void of pubescence. *Leaves* alternate, unequally pinnate, some ternate; from six to nine inches long. *Leaflets* generally five. The pairs opposite, from oblong to lanceolate, acuminate, entire, smooth; from four or five inches long, and from one to two broad. *Petioles* marked with the same sort of elevated rough white specks that are to be found on the young shoots. *Panicles* terminal, and from the exterior axils, length of the leaves, much crowded, and very dense; their numerous ramifications scarcely villous. *Bractes* minute. *Flowers* numerous, rather small, and white. *Calyx* five-parted; *segments* nearly equal, small, and oval. *Petals* five, oblong, spreading, a little villous. *Nectary* a large fleshy crenate ring round the base of the germ, within the filaments. *Filaments* ten, broad towards the base, but not in the least united, tapering regularly to the apex, which is very slender; they are inserted under the exterior part of the nectary, and are alternately a little shorter. *Anthers* small, oval. *Germ* superior, ovate, two-celled; *ovula* two in each cell, attached to the middle of the partition. *Style* short. *Stigma* peltate. *Berry* oval, size of a small olive, resting on the permanent corol, calyx, and stamina, one-celled. *Cortex* rather thin, and bright grey. *Seed* solitary, conform to the berry, before maturity or when imperfectly ripe, a pretty large quantity of a clear, very succulent exterior envelope, or aril is found, but when ripe it is scarcely to be seen. *Integuments* besides the aril, single. *Perisperm* none. *Embryo* straight, inverse. *Cotyledons* conform to the seed. *Radicle* obovate-truncate, superior.

2. W. *piscidia. R.*

II. *Leaves* subternate; *leaflets* subternate oblong, obtuse.
388 *Teling.* Wallursi.

Tam. Walsura.

A tree, a native of the mountainous parts of the Circars. It flowers during the cold season. Specimens of this, in the Banksian herbarium, are referred to *Trichilia*.

Trunk erect. *Bark* ash-coloured; in old trees deeply cracked. *Branches* very irregularly scattered, forming a thin head. *Leaves* alternate, petioled, subpinnate. *Leaflets* from two to four, alternate, oblong, entire, frequently emarginate, above smooth, of a deep, shining green, below whitish, from two to three inches long, and about one broad. *Stipules* none. *Flowers* numerous, small, of a dirty yellowish white colour, collected on small terminal panicles. *Bractes* minute, falling. *Calyx* interior, five-cleft, permanent. *Petals* five, equal, lanceolate, expanding. *Nectary* double; *exterior* cylindric, half the length of the petals, ten-cleft for two-thirds of its length; *divisions* emarginate, staminiferous; *interior*, a fleshy ring surrounding the base of the germ. *Filaments* ten, short, inserted into the notches of the divisions of the exterior nectary. *Anthers* oblong, erect. *Germ* roundish, sunk deep into the interior nectary, two, rarely three-celled with two *ovula* in each, attached to the partition. *Style* the length of the exterior nectary. *Stigma* large, turbinate. *Berry* oblong, downy, pulpy, one-celled. *Seed* one, large, oblong.

This tree has nearly the flowers of *Melia*, *Trichilia*, and *Swietinia*, but the fruit of *Muraya*; it may therefore constitute a new genus.

The wood serves for various economical purposes. I am informed by the natives, that if the bark in quantity is thrown into fish ponds, it soon kills the fish, which I believe is true,

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for it is rare to meet with a tree that has not been deprived of its bark. They do not esteem the fish the less wholesome, and it renders them easily caught, as they soon float, probably before they die; as is the case when *cocculus Indicus* is employed. This is the second species of fish poison, employed by the natives of this country, to enable them to catch fish, with little or no trouble. The fruit of *Gardenia dumetorum*, was the first which has been already taken notice of.

3. W. *ternata. R.*

Leaves ternate; *leaflets* narrow-lanceolate. *Panicles* axillary. *Nectary* gibbous, with divisions alternately rounding and bidentate.

Tam. Kaka-walsura.

Teling. Chinna-wallursi.

A small tree growing on the sides of hills. It flowers during the hot season.

Trunk erect; *bark* smooth, rust colour. *Leaves* alternate, petioled, ternate. *Leaflets* narrow-lanceolate, equal, entire, above smooth, of a deep shining green, whitish underneath; from four to five inches long, and one broad. *Petioles* semicylindric, rust-coloured, two inches long. *Stipules* none. *Panicles* axillary, middle-sized. *Bractes* single, small, caducous. *Flowers* very numerous, small, milk white. *Calyx* and *corol* as in W. *piscidia*. *Nectary*, the *exterior* one gibbous, and having only the apex of every other division bifid; the intermediate one, rounded, and a little shorter. *Interior* salver-shaped, with a large, high, callous margin. *Stamens* as in the former species. *Style* half the length of the gibbous nectary. *Stigma* large; apex two-lobed.

I have not seen the pericarp, but from the structure, and contents of the germ, I imagine it will be a one-seeded berry.

HEYNEA. (R.)

Calyx five-toothed. *Petals* five. *Nectary* cylindric with the anthers attached round the inside of its mouth. *Germ* two-celled; cells two-seeded; attachment interior. *Capsule* superior, one-celled, two-valved, one-seeded. *Seed* arilled. *Embryo* inverse, without perisperm.

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1. H. *trijuga. R.*

Leaves unequally pinnate; *leaflets* three pair. *Panicles* axillary, long-peduncled.

Kapyakooshee.

A native of Nepal: from thence, in 1802, Dr. Buchanan sent seeds of this tree, to the Botanic garden at Calcutta, under the vernacular name *yakooshee*, where in seven years, the young trees were about fifteen, and twenty feet high, with much the habit of the Walnut tree. Flowering time in the Botanic garden, March; the seed ripens in October.

Trunk straight, in our young trees about as thick as a man's thigh. *Bark* dark ash-coloured, and pretty smooth. *Branches* few; *young shoots* marked with scabrous spots. *Leaves* unequally pinnate, alternate, from one to two feet long. *Leaflets* opposite, short-petioletted, two or three pair, ovate-oblong, acuminate, entire, smooth, from four to eight inches long, and from two to four broad. *Petioles* round, smooth, swelled at the insertion of the leaflets. *Petioles* channelled, less than an inch long. *Stipules* none. *Panicles* axillary, solitary, long peduncled, smooth, erect. *Flowers* numerous, small, white. *Bractes* minute, caducous. *Calyx* one-leafed, five-toothed, permanent. *Petals* five, cuneate-lanceolate, spreading. *Nectarium* subcylindric, shorter than the petals, half ten-cleft, division alternately a little shorter, bifid. *Filaments* scarcely any. *Anthers* ten, ovate, three-lobed, crowned with an obtuse point, attached to the inside of the divisions of the nectary. *Germ* superior, immersed in a large fleshy ring, two-celled, with two *ovula* in each, attached to the middle of the partition. *Style* short. *Stigma* large, nearly round, with a two-toothed apex which is rather within the mouth of the nectary. *Capsule* round, the size of a small cherry, fleshy, one-celled, two-valved, opening round the apex. *Seed* solitary, round, invested in a complete, thin, white, sebaceous aril, which with the seed, as in the germ, are attached to what was the partition, now pressed to one side by the abortion of three-fourths of its original contents. *Integument* single, when recent orange, but soon changing to a chesnut colour, smooth, and strong, with a long white umbilicus strongly marking the side of attachment. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, hemispheric, conform to the seed, firm, green. *Plumula* small, two-lobed. *Radicle* superior, small.

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The back, leaves, and tender parts possess a considerable share of a peculiar bitter taste; and the cold infusions thereof, with the addition of a little sulphate of iron, becomes black; two principles very generally found amongst the plants of this natural order, which grow in India.

Specimens of another species were received from the Molucca Islands where the tree grows, but I have no drawing thereof. I however add a short definition below.

2. H. *quinquijuga. R.*

Arboreous. *Leaves* unequally pinnate; *leaflets* five pair. *Panicles*, the length of the leaves.

A tree, native of the Moluccas, with the perfect habit of a *Melia*.

EKEBERGIA. Schreb. gen. n. 619.

Calyx from four to five toothed. *Corol* five-petalled. *Nectary* cylindric, ten-cleft, antheriferous. *Germ* superior, five-celled, cells one-seeded. *Embryo* inverse, and furnished with a perisperm.

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1. E. *indica. R.*

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Shrubby. *Leaves* pinnate; *leaflets* grossly serrate. *Nectaries* ten-cleft to near the base. *Panicles* axillary.

Teling. Pooroodona.

Common throughout the Circars. It delights chiefly in the lower, sloping barren lands, about the bottom of mountains, where it grows to be a small tree. It flowers all the year round.

Leaves alternate, unequally pinnate, from six to nine inches long. *Leaflets* from four to six pairs, opposite, oblong, grossly serrate, smooth; the most exterior always largest, about three inches long, and one and a half broad. *Panicles* axillary, small, long-peduncled. *Flowers* small, white, inodorous. *Nectary* ten-cleft, cylindric; *segments* bifid. *Filaments* exceedingly short, inserted into the divisions of the ten segments of the nectary. *Germ* superior, five-celled, with one *ovula* in each, attached to the upper end of the axis. *Berry*, the size of a pea, round, smooth, when ripe red and somewhat succulent, five-celled. *Seed* solitary, reniform. *Integuments* two; *exterior* hard, thin, and elastic; *inner* membranaceous, and brown. *Perisperm* conform to the seed, soft and juicy. *Embryo* a little curved, inverse. *Cotyledons* oblong. *Radicle* oblong, superior.

I have not found that this species is employed in any shape except for fuel.

SANDORICUM. Schreb. gen. n. 1751.

Calyx five-toothed. *Corol* five-petalled. *Nectary* cylindric, bearing the ten anthers in its mouth. *Germ* superior, five-celled, cells two-seeded, attachment subsuperior. *Berry* five-seeded. *Embryo* inverse, no perisperm.

1. S. *indicum. Willd.* 2. 556.

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Sandoricum. *Rumph. Amb.* 1. *p.* 167. *t.* 64.

A most elegant tree, having a straight trunk, about ten or twelve feet in height, covered with smooth, greenish bark; the tree this measurement is taken from is in the Company's Botanic garden at Calcutta, about twenty-four years old, eighty inches in circumference, four feet above the ground, supporting a large, globular, dense head; it flowers in February, and the fruit ripens in the rainy season.

Leaves alternate, petioled, ternate, about a foot long. *Leaflets* ovate, entire, having the upper side smooth, except when young, and the lower one downy, the veins parallel, from five to seven inches long, and from three to four broad. *Petioles* round, when young downy. *Stipules* none. *Panicles* axillary, diffuse, shorter than the leaves. *Bractes* oblong. *Flowers* numerous, small, yellow. *Calyx* beneath, campanulate, five-parted; *divisions* rounded, downy. *Petals* five, linear-oblong, expanding. *Nectary* double; the *exterior* one cylindric, with a ten-toothed mouth; the *interior* one is one-fourth the length of the exterior one, enveloping the germ and base of the style, with its *mouth* about ten-toothed. *Filaments* none. *Anthers* ten, linear, affixed to the inside of the exterior nectary. *Germ* superior, five-celled, with two *ovula* in each, attached to the upper end of the axis. *Berry* nearly round, size of a small orange, slightly villous, when ripe yellow; *pulp* in large quantity, fleshy, acid, and edible, five-celled, but the partitions are often incomplete, when the seeds come to maturity. *Seeds* one in each cell, oblong, each enveloped in its own proper aril, as in the *guttiferæ; aril* replete with tough woolly fibres, which adhere firmly to the exterior, tough, parchment like *integument;* the *inner integument* brown, polished and spongy; attachment from the upper and inner edge to the upper end of the axis, as in the germ. *Perisperm* none. *Embryo* straight, inverse. *Cotyledons* two, conform to the seed. *Plumula* two-lobed. *Radicle* short, clavate, superior.

MELIA. Schreb. gen. n. 724.

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Calyx five-toothed. *Corol* five-petalled. *Nectary* cylindric, bearing the anthers in its mouth. *Germ* superior, five-celled; cells from one to two seeded; attachment subsuperior. *Drupe* with from a one-to a five-celled nut. *Seed* solitary. *Embryo* inverse, with little or no perisperm.

1. M. *azadiracta. Willd.* 2. 559.

Leaves pinnate; *leaflets* falcate. *Drupe* one seeded.

Sans. Nimba.

Teling. Vepa.

Beng. Neem, or Nimb.

Tam. Vepam.

Azedarach. *Burm. Zeyl.* 40. *t.* 15.

Aria-bepou. *Rheed. Mal.* 4. *t.* 52.

A middling sized, very common, beautiful, and very useful tree. Flowering time the hot season. It differs from all the other species known to me in having a one-celled, one-seeded nut, though the germ has uniformly five-cells, with one or two *ovula* in each.

2. M. *tomentosa. R.*

Leaves pinnate; *leaflets* ten paired, entire. Thryses axillary, solitary, long peduncled, simple.

Mal. Barang babee.

A native of Pulo Pinang, where it grows to be a large tree.

Leaves alternate, pinnate, six feet, or more in length. *Leaflets* opposite, ten or more pairs, subsessile, lanceolate, entire, fine-pointed, of a firm, leathery texture, reticulated, and very downy underneath; exterior pairs largest, often a foot in length. *Petioles* round, very

downy. *Stipules* none. *Racemes* axillary, solitary, long-peduncled, thyrsiform, compound. II.
Flowers pretty large, very numerous, crowded. *Bractes* subulate, downy. *Calyx* cup-shaped, 395
almost entire, downy. *Petals* five, wedge-shaped, expanding. *Nectary* cylindric, nearly the length of the petals, the ten divisions of its mouth linear, and ragged on the inside; exceedingly hairy. *Stamens* as in the genus. *Germ* ovate, hairy. *Style* as long as the nectary, hairy. *Stigma* globular.

The ripe fruit has not been found, but the germ has five cells, with one seed in each.

3. M. *sempervirens. Willd.* 2. 559.

Leaves bipinnate; *leaflets* ovate cordate, gashed, with taper, entire apices, smooth on both sides but not shining.

Melia foliis duplicato-pinnatis. *Flor. Zeyl.* 162.

Sans. Muha-nimba.

Hind. Bakarja.

Arab. Ban.

Teling. Turka-vepa.

A native of Persia, now common throughout India. Plants reared in the Botanic garden at Calcutta from seed received from the West Indies, did not in any respect differ from our own Asiatic sort. It blossoms the greater part of the year in our gardens, and is perfectly distinct from *Azedarak* which is a robust, deciduous timber tree, and this a small, delicate, ever green, of short duration, compared with the other.

4. M. *azedarak. Willd.* 2. 558.

Leaves bipinnate; *leaflets* obliquely ovate-lanceolate, serrate, taper-pointed, of a deep, shining green.

Shum-shu of the Chinese at Canton.

Melia *azadiracta. Gært. sem.* 2. *p.* 474. *t.* 180. *f.* 9.

A native of China, &c. In the Botanic garden at Calcutta it flowers during the hot season, II.
thrives luxuriantly and quickly becomes a large useful timber tree, of very great beauty. Its 396
flowers are like those of the *Lilac,* and are sweetly fragrant.

5. M. *superba. R.*

Leaves bi-tripinnate; *leaflets* ovate-cordate, serrate, acuminate, lucid. *Drupe* ovate; *nut* perforated with both ends.

A native of Soonda, where Dr. Berry found it, a forest tree of immense size. In the Botanic garden at Calcutta where it has been raised from the seed, sent by Dr. B. it has, in six years from the time the seed was sown, attained the height of forty or fifty feet, with a most stately trunk, of about four feet in circumference, at four feet above ground. Flowering time February and March, and the seed ripens in December and January.

Trunk nearly straight. *Bark* dark brown, dotted with small white specks. *Branches* generally trichotomous, their bark like that of the trunk. *Young shoots* mealy. *Leaves* alternate, in luxuriant young trees tripinnate, when older generally bipinnate; from two to four feet long, (in M. *robusta* they are only from twelve to eighteen inches long). *Pinnæ* from three to six pair, opposite. *Pinnulæ* ternate. *Leaflets* from three to seven pair to each pinna, generally opposite, petiolated, cordate, and ovate-cordate, crenate, smooth, acuminate; from three to five inches long. *Petioles* round, while young mealy. *Panicles* axillary, and lateral, round the base of the present annual shoots, large, ascending, very ramous, and of an ovate form, while young mealy. *Flowers* numerous, small, of a dull white, and offensive smell. *Bractes* small, lanceolate, nearly caducous. *Calyx* five leaved; *leaflets* ovate-lanceolate, incurved, mealy. *Petals* linear, concave, recurved. *Nectary* subcylindric, rather gibbous at the base, ten-ribbed, hairy on the inside; the ten teeth of its mouth divided into three, four, or five short, subulate II.
segments. *Germ* five-celled, with two seeds in each, attached from their upper and inner an- 397
gle, to the axis. *Style* cylindric. *Stigma* large, with a five-toothed apex. *Drupe* ovate, the size of a pigeon's egg, smooth, fleshy, when ripe yellow. *Nut* oblong, perforated, at both ends; *apex* five-toothed round the perforation, five-celled. *Seeds* solitary, lanceolar, attached from the apex. *Perisperm* in small quantity. *Embryo* straight, inverse, pale green. *Cotyledons* lanceolate. *Radicle* oval, superior.

6. M. *robusta. R.*

Leaves bipinnate; *leaflets* obliquely ovate, polished, entire, or with the anterior margins crenulate, acuminate. *Panicles* axillary. *Drupes* ovate. *Nut* with a quinquedentate apex.

A large tree, a native of Malabar, and introduced into the Botanic garden at Calcutta by Dr. Berry, where in seven years the trunk of the largest tree was forty-four inches in circumference, four feet above ground, and the total height forty-six feet. Flowering time March and April. The seed ripens in December.

Trunk very straight. *Bark* clean, smooth, dark brown. *Branches* large, not very numerous, but spreading considerably, their bark like that of the trunk, with some light grey, scabrous specks. *Young shoots* downy, with minute stellate pubescence. *Leaves* alternate, unequally bipinnate, from twelve to eighteen inches long. *Pinnæ* about three pair. *Leaflets* three, five, seven, or nine on each pinna, the pairs obliquely-ovate, and oblong; the terminal one biform, all are smooth, or rather polished, entire, or crenulate, acuminate, from two to three inches long. *Panicles* axillary, scarcely half the length of the leaves. *Flowers* numerous, small, white, fragrant. *Bractes* below the ramifications of the panicle, solitary, filiform, and often very long. *Calyx* five-leaved; *leaflets* ovate-oblong. *Petals* linear-lanceolar, recurvate. *Nectary* gibbous at the base; segments of its mouth minute and filiform. *Filaments* II.
none. *Anthers* sessile, round the inside of the mouth of the nectary. *Germ* ovate, five-cell- 398
ed, with two seeds in each, attached from their apex to the aril. *Style* the length of the nec-

Page Carey Ed. tary. *Stigma* large, with a five-pointed apex. *Drupe* ovate, the size of a large olive, smooth, of a yellowish green within, when ripe, one-celled. *Nut* oblong, a perforation at each end, which passes through the centre; *apex* deeply five-toothed, thick and hard, five-celled, five-valved, for by age and exposure they divide spontaneously. *Seed* solitary, lanceolar. *Integuments* two; the *exterior* one highly polished, black; the *inner* one membranaceous. *Perisperm* none. *Embryo* inverse. *Cotyledons* lanceolar. *Plumula* two-lobed. *Radicle* short, superior.

SWIETENIA. Schreb. gen. n. 723.

Calyx five-toothed. *Corol* five-petalled. *Nectary* subcylindric, bearing the anthers in its mouth. *Germ* superior, from three to five-celled; cells many-seeded; attachment interior. *Capsule* from three to five-celled, from three to five-valved. *Seeds* imbricated, and winged. *Embryo* inverse, no perisperm.

1. S. *febrifuga. Willd.* 2. 557. *R. Corom. pl.* 18. *t.* 17.

Leaflets from three to four pair, opposite, oval, and oblong, obtuse. *Panicle* terminal diffuse. *Capsules* five-celled, opening from the apex.

Teling. Soymida.

Beng. Rohína.

Tam. Wond-marum.

A native of the mountains of India. It flowers during the hot season. The bark is a powerful febrifuge, and an excellent substitute for Peruvian bark, which was one of Sir Wil-
II. liam Jones's desiderata; see *Asiat. Res. vol.* xi. 180.
399 2. S. *Chickrassa. R.*

Leaflets from six to eight-pair, sub-alternate, obliquely oblong, pointed. *Panicles* terminal, diffuse. *Capsules* three-celled.

Beng. Chikrassee.

A native of the mountainous parts near Chittagong, &c. to the eastward of Bengal. Flowering time the hot season, viz. April, and May. It is a timber tree of great size, with a thick, straight trunk, and dark rust-coloured bark, which is pretty deeply cracked, but inwardly very firm and of a pretty deep reddish brown colour, which is powerfully astringent, but without bitterness.

Leaves alternate, abruptly-pinnate, in luxuriant plants often bipinnate, from six to eighteen inches long. *Leaflets* subopposite, from two to ten pair, subsessile, obliquely-ovate; with a pretty long tapering point, entire, smooth on both sides, increasing in size towards the apex of the leaf. *Petioles* round, with here and there a small scabrous speck. *Stipules* none. *Panicles* terminal, erect, pretty large. *Flowers* numerous, pretty large. *Bractes* small. *Calyx* inferior, small, five-parted, the divisions expanding, linear, wedge-formed, slightly emarginate. *Nectary* nine-leaved, subcylindric, rather shorter than the petals, striated; mouth most slightly ten-toothed. *Filaments* minute, inserted into the top of the toothlets of the nectary. *Anthers* cordate. *Germ* oblong, striated, a little hairy. *Style* just long enough to raise the large peltate. *Stigma* even with the mouth of the nectary. *Capsule* oval, somewhat pointed, scabrous, the size of a small pullet's egg, three-celled, three-valved, with double integuments, and a three-winged receptacle. *Seeds* numerous, winged and imbricated in a double series across the cells.

The wood of this tree is greatly admired for its beauty, being of a light colour, and most elegantly veined; at the same time very close in the grain. It is employed to make furniture
II. of various kinds.
400 3. S. *chloroxylon. Willd.* 2. 557. *R. Corom. pl. p.* 49. *t.* 64.

Leaflets alternate, from ten to twenty-paired, semicordate, oblong. *Nectary* a fleshy ring, with the stamina inserted round its base. *Panicles* terminal. *Capsules* three-celled.

Teling. Billoo.

Cing. Boorootch gata.

Tam. Moodudad-marum.

This is our beautiful East Indian, satin wood tree, which grows in mountainous districts chiefly, and blossoms during the hot season.

GARUGA. (R.)

Calyx campanulate, five-toothed. *Corol* five-petalled inserted into the mouth of the calyx, alternate with five stamina, and just above the other five. *Germ* superior, five-celled; cells two-seeded; attachment subsuperior. *Stigma* five-lobed. *Drupe* with from one to five one-seeded nuts. *Embryo* inverse, no perisperm.

G. *pinnata. R. Ind. pl.* 3. *N.* 208.

Teling. Garuga, or Garugoo.

Katou-Kalesjam. *Rheed. Mal.* 4. *t.* 33.

Beng. Joom.

A tree of great size, a native of various parts of India. It flowers during the hot season. The fruit is eaten by the natives, both raw and pickled.

TRIBULUS. Schreb. gen. n. 732.

Calyx five-leaved, or five-parted. *Corol* five-petalled. *Style* none. *Germ* five-celled;

cells about three or four-seeded; attachment central. *Capsules* or *nuts* superior, five or more united, thorny, many-celled, cells one-seeded. *Embryo* centripetal, without perisperm.

T. *lanuginosus. Willd.* 2. 566.

Prostrate amongst grass, &c. *Leaves* about five-pair, oval, hairy. *Nuts* two horned.

T. terrestris zeylanicus. *Burm. zeyl.* 1. 106. *f.* 1.

Sans. Gokshooruka.

Beng. Gokhoor or Gokhoorec.

Common on pasture land in many parts of India, producing flowers and ripe seed great part of the year.

JUSSIEUA. Schreb. gen. n. 741.

Calyx from four to five-parted. *Corol* from four to five-petalled. *Capsule* inferior, from four to five-celled, opening at the angles. *Seeds* numerous.

1. J. *repens. Willd.* 2. 574.

Annual; floating by vescicles round the insertion of the alternate, obovate-cuneate leaves. *Flowers* axillary, five-petalled, decandrous.

Nir-carambu. *Rheed. Mal.* 2. *t.* 51.

Sans. Bhoolavungga, also Langulee.

Teling. Neer batsalla.

Hind. Kanchana.

Beng. Kesara-dam.

It is found in most parts of India, floating on lakes, and pools of fresh water; in flower during the rainy season.

2. J. *exaltata. R.*

Perennial, erect. *Leaves* alternate, sessile, narrow, lanceolate, downy. *Flowers* solitary, four-petalled, octandrous. *Capsule* nearly as long as the leaves.

Catta-carambu. *Rheed. Mal.* 2. 1. 50.

Beng. Bun-lung, or Lal-bun-lung.

Teling. Neeroo-agheendrapakao.

This species is perennial, it delights in moist places overgrown with small jungle. Flowering time the wet season.

Stem erect, when old woody. *Young parts* slightly four-sided, and downy. *Leaves* alternate, sessile, linear-lanceolate, entire, downy, from two to four inches long. *Stipules* minute, semilanceolate. *Peduncles* axillary, solitary, very short, one-flowered. *Calyx* four-cleft. *Petals* four, orbicular, clawed. *Stamens* eight, erect. *Capsule* four-celled.

MELASTOMA. Schreb. gen. n. 742.

Calyx campanulate, five-toothed. *Corol* five-petalled, inserted into the mouth of the calyx. *Germ* five-celled; cells many *seeded;* attachment to a cuneiform receptacle projecting from the axis. *Capsules* five-celled, involved in the calyx. *Seeds* numerous.

Note. All the species examined by me, have the *seeds* regularly attached to a cuneiform semilunar, *receptacle* in each cell, vertically united to the axis, as in *Osbeckia hirta Gært. sem.* 2. *t.* 126. I make this remark because Gærtner describes them to be nidulent; his seed vessels may have been old, and the receptacles decayed.

1. M. *ferruginea. R.*

Shrubby, all the tender parts, except the upper surface of the short-petioled, ovate-cordate, acuminate, entire leaves, covered with ferruginous, stellate pubescence. *Panicles* terminal. *Flowers* octandrous. *Calyx* with ample, obtusely four-lobed borders.

A native of Pulo Pinang.

2. M. *crinita. R.*

Shrubby, all the tender parts very hairy. *Leaves* petioled, lanceolate, from three to five nerved, entire. *Panicles* terminal; *flowers* octandrous; border of the calyx eight-parted; segments ensiform, four of them minute, all ciliate.

A native of the most moist, and shaded parts of the rocky coast of Chittagong where it blossoms in April and May. It is remarkable for its great quantity of long, distinct, appressed, pale coloured hair, and large beautiful red flowers.

3. M. *pulchella. R.*

Shrubby. *Leaves* short-petioled, lanceolate, entire; margins and nerves with a few appressed bristles. *Panicles* terminal; *bractes* cordate, bristle-ciliate. *Flowers* octandrous, in the bud, bristle-ciliate and ramentaceous.

A native of Chittagong.

4. M. *geniculata. R.*

Shrubby. *Leaves* subsessile, lanceolar, entire, scabrous, bristly, with three strigose nerves. *Flowers* terminal, triple, octandrous, alternate, filament jointed.

A large ramous shrub, a native of many parts of India.

Bark of the old branches pretty smooth, of the young very strigose; all round. *Leaves* opposite, short-petioled, lanceolar, entire, three-nerved, scabrous on both sides, not only from numerous, short, bristly hairs pointing forward, but also from a natural harshness; the under side of the nerves and petioles strigose. *Flowers* terminal, generally three-fold, short-peduncled. *Peduncles* very strigose. *Bractes* solitary, or in pairs to each flowers, ovate-concave, and falling off with, or soon after the petals, leaving the tube of the calyx for an envelope to the capsule. *Calyx* four-parted, very strigose; *divisions* cordate, acute. *Corol*

II. 404 four-petalled. *Filament* alternately enlarged with a second curved joint. *Anthers* recurved, linear. *Capsule* four-celled.

5. M. *cernua. I. R.*

Scandent. *Leaves* ovate-lanceolate, five-nerved, smooth. *Panicles* terminal, long, thin, drooping, with the ramifications four-winged *Flowers* octandrous.

A native of Chittagong. It flowers in October and November; and the seed ripens in February, and March.

The leaves in this elegant large rambling species that occupy all but the base of the panicle are rather long-petioled, remarkably large, often a foot long, and from three to four inches broad; with the nerves particularly large and distinct to the very apex; those close to the panicles are sessile, and very exactly cordate: the panicles are also uncommonly long, as far as two feet, or more, and droop elegantly when loaded with its profusion of middling sized, bright red flowers.

6. M. *vagans. R.*

Scandent. *Leaves* ovate-cordate, bristle-serrulate, acuminate, three or five-nerved; petioles and nerves hairy. *Panicles* terminal, large and decussated, *flowers* octandrous.

Beng. Juy-phutkee.

An extensive, beautiful scandent shrubby species, a native of the hilly countries immediately east of Bengal where its numerous, small, bright red flowers appear in October, and the seed ripens during the ensuing hot season. The young shoots, petioles, and nerves of the leaves are the only hairy parts, and but in a small degree, all the rest are smooth; the leaves are large, about six inches long, and three broad.

II. 405 7. M. *impuber. R.*

Smooth in every part. *Leaves* long-petioled, ovate-cordate, entire, three-nerved, (beside the marginal rib.) *Panicles* terminal, divaricate. *Flowers* octandrous. *Calyx* subcylindric, with the mouth obscurely four-toothed. *Capsule* hid in the bottom of the calyx.

A native of the Moluccas. The flowers in this pretty, smooth species, are uncommonly small, with the oval petals shorter than the filaments, which are all simple, and shorter than their anthers.

8. M. *cordifolia. R.*

Scandent, every part smooth. *Leaves* short-petioled, cordate, entire. *Panicles* terminal. *Flowers* octandrous. *Petals* ovate. *Calyx* with an ample, obtusely four-lobed border.

A native of Chittagong and Pulo Pinang.

9. M. *malabathrica. Willd.* 2. 592.

Shrubby, tender parts strigose. *Leaves* entire, broad-lanceolar, from three to five-nerved, scabrous, with appressed, short, sharp, flat bristles. *Flowers* terminal, and surrounded with ovate-cordate bractes, divisions of the calyx cordate, acute.

Kadali. *Rheed. Mal.* 4. *t.* 42.

A large shrub, or small tree, a native of our Circar mountains, Chittagong, &c. It flowers in March.

Leaves opposite, short-petioled, broad lanceolar, from three to five-nerved, entire, scabrous, particularly above; about four and a half inches long, and one and a half or two broad. *Flowers* terminal, short-peduncled, large, red. *Calyx* and *Corol* as in the genus. *Filaments* ten, yellow, five are short, tapering, ending in a crescent-shaped gland, in which the anthers sit; five others are alternate with those five, double their length, have a bend, with a cres-
II. 406 cent-shaped process on their middle. *Anthers* linear, erect. *Germ* hairy, five-celled, with numerous *ovula* in each cell, attached to their semi-ovate cuneate receptacles, which adhere vertically to the axis, as represented in *Osbeckia hirta. Gert. sem.* 2. *t.* 126.

10. M. *decemfida. R.*

Shrubby. *Leaves* petioled, lanceolar, three or five-nerved, entire, smooth, except a few bristles on the nerves. *Flowers* terminal, decandrous. *Calyx* ten-cleft, and very shaggy, with long stiff hairs.

A native of hills on Pulo Pinang, in flower and seed in July and August.

11. M. *curva. R.*

Shrubby; all the tender parts trigose *Leaves* petioled, ovate-cordate, from five to seven-nerved, finely serrulate. *Panicles* terminal, corymbiform, supradecompound. *Flowers* decandrous. *Petals* cordate, ciliate.

A native of Chittagong.

12. M. *furcata. R.*

Shrubby, tender parts a little bristly. *Leaves* short-petioled, oblong, three-nerved, entire. *Flowers* terminal, long-pedicelled, decandrous. *Calyx* covered with bifid strigæ, the segments of its border subulate, and deciduous.

A native of the Moluccas, a slender, delicate species.

13. M. *dodecandra. R.*

All the tender parts more covered with bristles than the lanceolate, entire, three-nerved leaves are. *Flowers* in terminal fascicles, dodecandrous, twelve segments of the very bristly calyx deciduous. *Filaments* alternately doubled.

A native of the Moluccas, and by far the largest-flowered species I have yet met with; when full blown they expand from four to five inches. The capsule has only five cells.

II. 407

GASTONIA. Juss. gen. n. 242.

Calyx obscurely from eight to ten-toothed. *Petals* from eight to ten. *Germ* inferior, from

eight to ten-celled; cells one seeded; attachment superior. *Stigma* from eight to ten-rayed. *Capsule* evalvular, from eight to ten-celled. *Seed* solitary. *Embryo* inverse, and furnished with a perisperm. Page Carey Ed.

1. G. *palmata. R.*

Sub-arboreous, armed. *Leaves* palmate, serrate; *petioles* armed.

An erect, stout shrub, or small tree; every part well armed with numerous, short, straight prickles. A native of the moist vallies of Chittagong, where it blossoms in January and February, and the seeds ripen in May and June.

Stem, in luxuriant plants in the Botanic garden at Calcutta now three years old, straight, nearly simple, about as thick as our largest walking canes, from six to seven feet high, completely armed with numerous, small, straight and incurved prickles, toward the leaves, round, the top intermixed with appressed, ferruginous, stiff bristles. *Branches* only two or three from the lower parts of the stem, where it is thicker, and more ligneous, in every respect like the stem. Full grown trees in their native vallies, are from ten to twelve feet high, with stems twelve inches in circumference, bearing only a few branches at the top. The *leaves* round the top of the stem and branches are nearly round, alternate, approximate, petioled, palmate; from five to nine-lobed, from five to nine-nerved, of a hard texture, the upper surface pretty smooth, the under one rather rough; *lobes* lanceolate, acuminate, acutely serrate; sinuses round; the length and breadth from twelve to thirty-six inches. *Petioles* often as long as the leaves; base somewhat sheathing with one bidentate, acute, stipulary process on the inside; from thence to the thickened incurved apex columnar, and armed with small prickles; which are more numerous about the apex, and ramentaceous. *Panicles* axillary and terminal, composed of a few, long-peduncled, simple *umbellets;* the whole much shorter than the leaves. *Involucres* a few, ensiform, ferruginous scales. *Bractes* solitary at the division of the panicles, sheathing, tapering, acute, ferruginous. *Flowers* numerous, pretty large, white. *Calyx* superior, small, with a sub-truncate margin, being only obscurely marked with from eight to ten denticles, clothed on the outside with mealy ferruginous down. *Petals* from eight to ten, generally ten, lanceolate, spreading. *Filaments* from eight to ten, generally ten, alternate with the petals, and about the same length, or rather longer. *Anthers* of two very distinct linear-oblong lobes, which separate more at the base. *Germ* turbinate, from eight to ten-celled, with one *ovula* in each cell, attached to the top of the axis. *Style* short, conic, from eight to ten grooved, permanent. *Stigma* concave, with its margin marked with as many elevations, as there are cells in the germ. *Berry* or *capsule*, nearly round, crowned with the remaining calyx, the size of a nutmeg, somewhat mealy, thin, and of a soft ligneous texture, from eight to ten-celled, evalvular (never, by any mode yet observed, opening spontaneously.) *Seed* solitary, conform to the cell, consequently very thin, particularly the inner edge. *Perisperm* conform to the seed. *Embryo* inverse, *Cotyledons* two, lanceolate. *Radicle* oblong, superior. II. 408

2. G. *sasuroides. R.*

Unarmed. *Leaves* simple.

A native of the Moluccas, and nearly allied to Rumphius's *Sasuru* or *Pseudo-sandalum*, *vol.* 2. *t.* 12. Here the umbellets are decompound; the first rays numerous; the second dichotomous; and the third many-fold, and short. II. 409

RHODODENDRON.

Calyx five-parted. *Corol* infundibuliform. *Stamina* declined. *Capsule* five-celled.

1. R. *puniceum. R.*

Arboreous. *Leaves* lanceolar, coriaceous, hoary underneath. *Racemes* terminal. *Bractes* ensiform, sericeous. *Corol* campanulate; *segments* retuse. *Capsules* ten-celled.

Boorans. *Hardw. in Trans. Asiat. Soc.* 6. 359.

A large tree, a native of the mountains north of Rohilkhund, &c. It flowers in April and May.

Trunk from twenty to thirty feet high, in large trees about two feet in diameter. *Bark* suberous, light, scaling off in irregular pieces, of an inch in thickness, and composed of numerous, reddish cinnamon-coloured lamina of about half a line in thickness; the exterior one of a burnt brown. *Branches* numerous, very crooked. *Leaves* alternate, about the ends of the branchlets, short-petioled, lanceolate, entire, coriaceous; smooth above, hoary underneath; about six inches long. *Stipules* none. *Germs* terminal, imbricated. *Racemes* terminal, sessile, subglobular, much shorter than the leaves, crowded with large, beautiful, deep crimson flowers. *Bractes; exterior*, before the flowers expand, imbricated, strobiliform; large, of a shape from oval to cuneiform, solitary, one-flowered clothed on the outside with much, long, beautiful, sericeous, pale yellow pubescence; the *interior* two, filiform, inserted on opposite sides of the pedicells near the base. *Calyx* small, unequally five-toothed. *Corol* campanulate, [illegible] *Border* of five nearly equal, broad, retuse segments, the uppermost one [illegible] *Filaments* ten, shorter than the corol, unequal, declining. *Anthers* open with two pores at the top. *Germ* superior, ovate-oblong, sericeous, ten-grooved, ten-celled. *Style* longer than the stamina, curved. *Stigma* large, infundibuliform, with a ten-notched margin. *Capsule* linear-oblong, pretty smooth, and void of pubescence, ten-celled, ten-valved. *Receptacles* very thin, vertically attached to the axis, and projecting far into the valves. *Seeds* numerous, minute, somewhat winged. II. 410

Colonel Hardwicke informs us that the wood is in estimation among the natives, for making gun stocks, or the stocks of their match-lock pieces.

To introduce this beautiful tree in the Botanic garden at Calcutta, many attempts have

Page Carey Ed. in vain been made; the seeds are exceedingly minute, and have always proved abortive.

Dr. Rutherford, of Mooradabad, who has just sent me seed and specimens, writes that he had at last penetrated to the second range of Hills in the neighbourhood of Chipea, and there had an opportunity of seeing this most lovely of all trees in its glory, and says, "On "the leaves of the accompanying specimens, you will observe a substance encrusted like su- "gar, or honey. I was much struck with this appearance, for the trees on which it was first "observed, glistened in the sun as if they had been just moistened with rain, and my sur- "prise was not a little encreased when I discovered that this substance was sweet as the most "delicious honey. It existed in various degrees of density, from the thinest varnish, to a "crust of several lines in thickness; while from some leaves it hung in drops, that were some- "times soft and pellucid, at others opaque and solid like candied sugar; what is remarkable,
II. "the southern face of the trees only presented this appearance, nor was it observed in any but
411 "those at the very summit of the mountain. To us, parched with thirst, and exhausted with "fatigue it proved extremely grateful; though afterwards, a somewhat different feeling was "excited. On discovering that the underside of the leaves was covered with thousands of in- "sects, of a faint green colour, and so minute as to be barely distinguishable by the naked "eye, at first I supposed that the honied substance must have been a formation of these in- "sects; but I was afterwards able to correct this notion, by observing that some of the stems "and branches, which were hoary with lichens, were likewise covered with it, though no traces "of the insects could be observed. The nectaries of the flowers were plentifully supplied "with honey; but in them it was fluid, and transparent as water."

FERONIA.

Correa in Trans. of Linn. Soc. 5. 224.

Calyx from four to five-toothed. *Corol* from four to five-petalled. *Germ* superior, one-celled; *ovula* numerous, attached to five parietal receptacles. *Berry* spherical, covered with a hard cortex, one-celled. *Seeds* numerous, immersed in pulp. *Embryo vaga* without perisperm.

1. F. *elephantum. Willd.* 4. 973. *R. Corom. pl.* 2. *N.* 141.

Crateva vallanga. Kön. Mss. by some written balanga, or balangas.

Capittha. *Asiat. Res.* 4. *p.* 280.

Anisifolius. *Rumph. Amb.* 2. *t.* 43.

Beng. Kath-bel.

Teling. Yellanga.

Tam. Vallanga, or Vola-marum.

II. *Eng.* Elephant, or wood apple.

412 A large tree, yielding very hard, durable timber, found in most parts of India. Flowering time the beginning of the hot season. The germ is one-celled, containing numerous *ovula* attached to five parietal receptacles. The fruit edible, and much esteemed by many.

ARBUTUS. Schreb. gen. n. 750.

Calyx five-parted. *Corol* ovate, diaphanous at the base. *Berry* superior, five-celled.

A. *herpetica. C.*

Arboreous. *Leaves* ovate, entire, pointed. *Racemes* terminal, drooping. *Berries* many-seeded.

Found by Colonel Hardwicke, amongst the mountains on his tour to Sirinagur. *See Asiat. Res. vol.* 6. *p.* 360.

CERATOSTEMA. Juss.

Calyx five-parted. *Corol* tubular, subcylindric; mouth five-cleft. *Anthers* long-horned. *Germ* inferior, five-celled; cells many-seeded; attachment central. *Berry* five-celled, many-seeded. *Embryo* centripetal, and furnished with a perisperm.

1. C. *vaccinacea. R.*

Shrubby. *Leaves* subverticelled, narrow-lanceolar, serrate. *Racemes* axillary, the length of the leaves.

An elegant, very ramous shrub, a native of the Garrow hills, where it is called Kesaproom, the flowers have an acid taste, and are eaten by the natives in their curries. Flowering time April; the seed ripens in July.

Branches and branchlets numerous, and very erect; the *young* twigs rough with the wither-
II. ed permanent stipule, like ensiform scales; general height of the shrub about six feet. *Leaves*
413 tending to be verticelled, subsessile, narrow-lanceolar, serrate, acute, smooth, three inches long, and half an inch broad. *Racemes* axillary, the length of the leaves. *Flowers* numerous, drooping from the exterior side of the raceme, small, white, tinged with green. *Bractes* two, small, on each pedicel near the base. *Calyx* superior, five-toothed, permanent. The base is joined to the enlarged apex of the pedicel by a contracted articulation. *Corol* tubular. *Tube* considerably gibbous. *Mouth* five-toothed, and contracted. *Filaments* ten, inserted on the base of the tube of the corol. *Anthers* linear, ending in a linear, brown scariose flat *arista*, as long as the anthers themselves, the whole shut up within the corol. *Germ* inferior, five-celled, with two vertical rows of *ovula* in each, attached to the axis. *Style* the length of the corol. *Stigma* five-lobed. *Berries* inferior, globular, succulent, the size of a small pea, smooth, of a greenish-yellow when ripe, five-celled. *Seeds* many in each cell, oblong, rugose. *Perisperm* soft, and white.

Embryo straight, cylindric, green, nearly as long as the perisperm. *Cotyledons* oblong. *Radicle* cylindric, the length of the cotyledons, centripetal. Page Carey Ed.

2. C. *variegata. R.*

Shrubby. *Leaves* lanceolar, entire. *Racemes* axillary, few-flowered, drooping.

Beng. Jalamoot.

A stout shrubby plant, a native of mountain forests near Chittagong, Silhet, and on the Garrow hills, where it blossoms during the cool season, when its numerous, most beautiful, large, variegated, rosy flowers are highly ornamental; the seed ripens in July.

Branches thick, ligneous, and of a stunted appearance, covered with rough, ash-coloured bark. *Young shoots* smooth, and coloured. *Leaves* alternately crowded about the ends of the branchlets, subsessile, lanceolar, entire, firm and smooth; from five to six inches long and one and a half or two broad. *Stipules* none. *Peduncles* axillary, but chiefly from the old axils on the two to three year old branches, solitary, or in pairs, very short, from five to twenty flowered, smooth. *Pedicels* much longer than the peduncles, smooth, clavate, highly coloured, pendulous, having the apex enlarged into a saucer-shaped receptacle for the germ. *Flowers* large, (two inches long,) pendulous, of a variegated pink and red colour, with the mouth greenish. *Bractes* some triangular scales at the base and divisions of the peduncle. *Calyx* superior, five-parted. *Segments* smooth, conical, and acute. *Corol* one-petalled. *Tube* considerably gibbous toward the middle; the shades of colour appear imbricated, and acuminate; *mouth* five-cleft; *segments* taper, rather obtuse, and greenish. *Filaments* ten, short, scariose, sometimes slightly united at the base, inserted partly on the crown of the germ, and the base of the tube of the corol on the inside. *Anthers* linear, of a bright rust colour, two-celled, crowned with a very long, scariose, bright, gold coloured horn, which reaches to the mouth of the corol, and united their whole length into a tube round the style. *Germ* inferior, urn-shaped, five-celled, with many *ovula* in each, attached to the axis. *Style* the length of the corol. *Stigma* five-lobed. *Berries* inferior, turbinate, crowned with the permanent calyx, the size of a small cherry, succulent; when ripe the colour is a mixture of red and yellow, five-celled. *Seeds* many, linear-oblong, inserted as in the germ. *Integument* single. *Perisperm* conform to the seed, soft, and clammy. *Embryo* nearly straight, cylindric. *Cotyledons* two. *Radicle* columnar, apex at the umbilicus (centripetal.) II. 414

STYRAX. Schreb. gen. n. 753.

Calyx five-toothed. *Corol* one-petalled, five-cleft. *Germ* superior, one-celled, many-seeded; attachment inferior. *Drupe* dry; *nut* one or two-seeded. *Embryo* erect, and furnished with a perisperm. II. 415

1. S. *serrulata. R.*

Leaves oblong, acuminate, serrulate, smooth. *Racemes* terminal, simple.

Beng. Koom-jameva.

A small tree, a native of Chittagong, where it blossoms in March, and the seed ripens in October.

Branchlets alternate, the extreme tender parts only villous, with a little, minute, stellate pubescence. *Leaves* alternate, short-petioled, broad-ovate-lanceolate, serrulate, acuminate, while young somewhat villous underneath, about three inches long, and from one to one and a half broad. *Stipules* none. *Racemes* terminal, generally on very short lateral branchlets, solitary, simple, shorter than the leaves. *Peduncles* and *pedicels* villous. *Flowers* pretty large, alternate; besides those which occupy the racemes there are two, or three, on pretty long, recurvate, proper peduncles, in each of the exterior axills. *Bractes* subulate, villous. *Calyx* campanulate; *mouth* repand-dentate, the outside and margins villous. *Corol* one-petalled. *Tube* short, cylindric. *Border* six-cleft; *divisions* lanceolate, villous on the outside. *Filaments* ten, inserted into the mouth of the tube of the corol, and there broad and woolly. *Anthers* linear, erect. *Germ* superior, ovate, villous, one-celled, containing a number (from ten to fifteen) of seeds attached to a receptacle, which rises but little above the bottom of the cell, and is also in some measure attached to the sides of the germ by three *partial* partitions, in short, semi-trilocular. *Style* the length of the stamina, smooth. *Stigma* obscurely three-lobed. *Drupe* or *capsule* superior, ovate, the size of a small nutmeg, clothed with short, soft, grey, thin, and rather bristly, pubescence one-celled, when ripe, slitting irregularly from the base, into two, three, or four irregular portions. *Nuts* or *seeds* generally from one to four, consequently their shape varies much, attached as in the germ. *Integuments* two; the *exterior* one somewhat nuciform, pretty smooth, dark brown, the *interior* one membranaceous. *Perisperm* conform to the seed, of a firm texture, and dull whitish grey colour. *Embryo* erect, nearly as long as the peri-sperm. *Cotyledons* ovate-lanceolate. *Radicle* oblong, inferior. II. 416

2. S. *benjoin. Willd.* 2. 623. *Dryand. in Phil. Trans.* 77. 308. *t.* 12.

Leaves alternate, oblong, tapering to an obtuse point; *racemes* (panicle,) axillary, compound, not villous, one-seeded.

Benjamin, or Benzoin, *Marsden's Sumatra, p.* 123.

Luban the Bengalee, and Arabic name of the resin, though in fact this name ought to be applied to the resin of my *Boswellia thurifera*, which is the real *olibanum* or Frankincense, of the ancients.

INOCARPUS.

Calyx bidentate. *Corol* infundibuliform; five-cleft. *Stamina* in a double series from the

Page Carey Ed. tube. *Germ* superior; one-celled; one-seeded; attachment superior. *Drupe* one-seeded. *Embryo* inverse; no perisperm.

I. *edulis. Linn. suppl.* 239.

Gajanus. *Rumph. Amb.* 1. *p.* 170. *t.* 65.

A native of the Molucca Islands, and from thence introduced into the Botanic garden at Calcutta in 1798, where in ten years the largest of them was twenty-five or thirty feet high; they blossom during the hot season, and ripen their fruit in August and September.

II. 417 *Trunk* straight. *Bark* smooth; of a greenish-ash colour. *Branches* spreading with numerous, bifarious, flexuose, beautifully drooping branchlets. *Leaves* alternate, bifarious, short-petioled, permanent, oblong, emarginate, entire, both sides polished, and of a deep shining green colour; from six to twelve inches long, and about three or four broad. *Stipules* minute, caducous. *Spikes* axillary, sessile, solitary, or in pairs, much shorter than the leaves. In the Bengal plant smooth. *Flowers* numerous, small, very pale yellow, fragrant. *Calyx* bilabiate. *Corol* funnel-shaped. *Border* five-cleft; *segments* lanceolate. *Filaments* ten, in a double series, hid in the tube, and inserted into it. *Anthers* oval, those of the upper series even with the mouth of the tube of the corol. *Germ* superior, oval, one-celled, containing one-seed, attached to the top of the cell, immediately under the stigma, for there is no style. *Drupe* obliquely oval, the size of a goose's egg, a little compressed laterally, smooth, when ripe yellow, and of a tough fibrous texture, one-celled, two-valved, opening round the margin into two equal portions. *Nut* solitary, thick, two-valved, one-celled, and of a hard, tough fibrous consistence. *Seed* single, conform to the nut, and attached to it immediately under the stigma. *Integuments* two, the *exterior* one brown, firmer and thicker than the inner one, and beautifully marked with numerous, ramous, veins; the *inner* one membranaceous. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, conform to the seed, amygdaline. *Plumula*, in seeds beginning to vegetate, it consists of several imbricate scales. *Radicle* superior, cylindric, and lodged immediately within the umbilicus, under the stigma.

The rapid growth of this very beautiful, ever green tree, and the elegant shape of its spreading, dense crown of deep green foliage, renders it one of the most ornamental presents Bengal has got from the Molucca Islands. The kernel is certainly edible, but by no means palatable. As yet I can say nothing of the quality of the timber.

II. 418

CASEARIA. Schreb. gen. n. 756.

Calyx five-leaved. *Corol* none. *Nectarial* filaments eight, or ten, distinct, and alternate, with the same number of stamina. *Germ* superior, one-celled, many-seeded, attachment parietal. *Capsule* berried, three-valved, one-celled. *Seeds* nidulent. *Embryo* in some centripetal, in others centrifugal, and between those directions, with a perisperm.

1. C. *vareca. R.*

Shrubby. *Leaves* linear-oblong, and lanceolate, very finely serrulate. *Flowers* axillary, crowded, octandrous. *Stamina* and *nectaries* on the bowl of the one-leaved calyx.

Vareca. *Gært. sem.* 1. *p.* 290. *t.* 60.

Tetahehera the vernacular name in Silhet, where it is indigenous; it flowers in May, and the seed ripens in September and October. *Young shoots* straight, rather angular, and somewhat hairy. *Leaves* alternate, bifarious, short-petioled, linear-oblong, and lanceolate, very finely, and acutely serrulate, a little hairy underneath; from three to six inches long, and from one to two broad. *Stipules* cordate, villous. *Peduncles* axillary, crowded, short, one-flowered, the insertions embraced by many, small, scariose bractes. *Flowers* small, of a greenish grey colour. *Calyx* one-leaved, bowl-shaped, the *border* divided into five orbicular segments. *Nectarial* scales broad, short, and hairy, inserted alternately with the filaments, into the middle of the tube of the calyx. *Filaments* eight, short, slightly united to the nectarial scales. *Anthers* cordate. *Germ* superior, ovate, one-celled, containing several *ovula* attached to three equi-

II. 419 distant portions of the middle of the ovarium. *Style* short. *Stigma* capitate. *Capsule* superior, oval, the size of a french bean, smooth, one-celled, three-valved, opening from the apex; the edge of the valves elevated. *Seeds* generally six, oblong, attached to the middle of the valves, enveloped in a little succulent aril, which dries into Gærtner's partial cells. *Integuments* two; the *exterior* one thin and white; the *interior* one firmer and brownish. *Perisperm* conform to the seed, oily. *Embryo* green, shorter than the perisperm, straight. *Cotyledons* cordate. *Radicle* cylindric, centrifugal.

2. C. *glomerata. R.*

Shrubby. *Leaves* bifarious, ovate-lanceolate, acutely serrulate, smooth. *Flowers* axillary; peduncled, crowded, octandrous. *Capsules* berried, two-valved, five-seeded.

Loorjoor the vernacular name in Silhet where it is found indigenous in the forests. Flowering in December, and the seed ripening in March.

Trunk short, dividing soon into many, nearly erect, smooth branches and branchlets. *Leaves* bifarious, short-petioled, from ovate to ovate-lanceolate, sharply serrulate, smooth on both sides, from two to four inches long, and one and a half broad. *Stipules*, a brown downy scale, on each side of the insertion of the leaves. *Flowers* axillary, very numerous, small, of a greenish-yellow, each with a distinct peduncle. *Calyx* five-leaved. *Corol* none. *Nectary* of eight hairy filaments, alternate with, and shorter than those of the stamina. *Filaments* eight, incurved. *Anthers* cordate. *Germ* superior, ovate, one-celled, containing a few, from four to six, *ovula* attached oppositely to the inside of the cell near the middle. *Style* rather shorter than the stamina. *Stigma* large, subpeltate. *Capsule* berried, oblong, fleshy, somewhat ventricose, the size of a very small olive, one-celled, two-valved. *Seeds* generally from three to six

attached in the germ, nearly round, invested in a small portion of a red, soft aril. *Integuments* two, the *exterior* one thin, but firm like parchment, and white; the *interior* one membranaceous. *Perisperm* conform to the seed. *Embryo* straight. *Cotyledons* two, cordate, green. *Radicle* directly opposite to the umbilicus, centripetal. II. 420

3. C. *ovata. Willd.* 2. 629.

Arboreous. *Leaves* alternate, bifarious, ovate-oblong, serrulate. *Flowers* axillary, crowded, octandrous. *Calyx* five-leaved.

Stamens and *nectaries* distinct.

Anavinga. *Rheed. Mal.* 4. *t.* 49.

A pretty large tree, with an erect trunk, and numerous spreading and drooping branches, and branchlets. Found in the garden of Mr. Cowper on the banks of the Hoogly just below Calcutta, and was in full blossom in March, the old leaves were then falling, and the new ones just beginning to appear.

Leaves alternate, bifarious, drooping, ovate-oblong, and oblong serrulate, downy underneath. *Petioles* short, round, villous. *Stipules* small, villous, caducous. *Flowers* axillary, or from the old axills of the new leafless branchlets, much crowded into globular heads, small, of a pale green. *Peduncles* short, one-flowered, surrounded at their insertions with numerous, short, chaffy, villous involucres; these, when the flowers are removed, form a round chaffy receptacle, like that of many of the *syngenesious* flowers. *Calyx* five-leaved; *leaflets* ovate, villous. *Corol* none. *Nectaries* eight subclavate, ciliate bodies, distinct from and alternate with the antheriferous filaments, and about half their length. *Filaments* eight, subulate, rather shorter than the calyx. *Anthers* two-lobed, on the anthers or the filaments being touched, or otherways irritated, they immediately expand and approach the base of the stigma, by means of an articulation at the base of the filament, which admits of this motion. *Germ* above ovate. *Style* the length of the stamens, villous. *Stigma* large, somewhat three-lobed. II. 421

The mature fruit has not been seen.

4. C. *glabra. R.*

Arboreous. *Leaves* bifarious, alternate, drooping, ovate-lanceolate, slightly and remotely serrulate, smooth. *Flowers* axillary, decandrous. *Stamens* and *nectaries* inserted distinctly from each other.

Of this there is a single small tree in the Botanic garden at Calcutta, raised from seed from the Molucca Islands; it is in flower most part of the year, but never produces fruit, yet the flowers seem perfect hermaphrodites. The trees are now above ten years old, with a straight trunk, up through the diverging, or rather drooping branches to the very top of the little tree.

5. C. *tomentosa. R.*

Leaves alternate, oblong, serrate, downy. *Flowers* axillary, octandrous. *Stamina* and *nectaries* united at the base.

Teling. Gamgudoo.

A small handsome tree, a native of most of the Circars, but not abundant. It flowers about the beginning of the hot season.

Trunk erect. *Branches* spreading, horizontal; *branchlets* bifarious; *young shoots* downy. *Leaves* alternate, bifarious, short-petioled, ovate or oblong, serrate, downy underneath; from three to five inches long, and from one and a half to two and a half broad. *Stipules* small, downy. *Peduncles* axillary, many, short, one-flowered. *Flowers* small, downy, of a greenish yellow. *Calyx* five-cleft to the bottom; *segments* oval, hairy. *Nectary* a small flat ring surrounding the base of the germ; from it projects eight, clubbed, hairy, divisions. *Filaments* eight, alternate with the divisions of the *nectary* and inserted into it; length of the calyx. *Anthers* oval. *Capsule* oblong, the size of a nutmeg, fleshy, sulcated, three-valved, one-celled. *Seeds* many, nestling in a scarlet nidus. II. 422

6. C. *esculenta. R.*

Leaves alternate, oblong, entire, smooth. *Flowers* axillary, octandrous. *Stamina* and *nectaries* united at the base.

Tojeron kanneli. *Rheed. Mal.* 5. *t.* 50. seems to be this plant.

Teling. Kunda-jungura.

This I have found only amongst the Circar mountains; it is a large shrub, differing from the last in size, and in having the leaves and every part perfectly smooth and shining; in other respects they are the same.

The leaves are eaten in stews by the natives. The roots are purgative, and as such used by the hill people.

I have, without success, tried to extract a good colour from the red nidus of these plants.

AQUILARIA. Schreb. gen. n. 1753.

Calyx campanulate, five-cleft. *Corol* none. *Nectary* ten-leaved, alternate with the stamina. *Germ* superior, two-celled; cells one-seeded; attachment interior. *Capsule* two-celled, two-valved. *Seed* solitary. *Embryo* inverse, without perisperm.

A. *Agallocha. R.*

Leaves lanceolar. *Umbels* lateral, subsessile.

Sans. *Ugooroo* the name of the incense, or Aloe wood.

Hind. and *Beng.* Ugoor.

Arab. Ayaloogi, Ayuloogin, Yellanjooj, &c.

Pers. Ayaloor-chee, Oud, or Oud Hindee.

Eng. Agallochum, or Aloe wood. II. 423

Page Carey Ed.

An immense tree, a native of the mountainous tracts East and South East from Silhet, in about the latitude of twenty-four and twenty-five north. Flowering time the month of April; the seed ripens in August.

There can be little, or no doubt, that this is the tree which furnishes the real Calambac or Agallochum of the ancients, and there seems more reason to think that it was carried to China from our eastern frontier, than to suppose it was carried from Cochin China, or any other country in the vicinity of China, where it has always been in great demand. Small quantities are sometimes imported into Calcutta by sea, from the eastward; but such is always deemed inferior to that of Silhet. Thriving plants of the Goro de Malacca received from that place, are now in the Botanic garden and so exactly like plants of the same age and size of our species, that they cannot be distinguished. But for proof positive of their being the same, we must wait till the Malacca plants blossom, and ripen their fruit, or till good specimens that can be depended on, in those states are obtained (and they are promised;) till then we may be allowed to consider A. *ovata. Willd.* 2. 629. as another species of the same genus.

HARDWICKIA. R.

Calyx none. *Corol* from four to five-petalled. *Legume* capsular, one-seeded.

1. H. *binata. R.*

Leaves binate; *leaflets* semicordate.

Tam. Acha, alti-marum.

II. 424

This elegant tree is found indigenous on the mountains of the coast of Coromandel, where it grows to a large size, and yields timber of an excellent quality for a variety of uses.

Trunk tolerably straight. *Bark* deeply cracked. *Branches* numerous, spreading in every direction, with bifarious, alternate, slender, smooth, waving, drooping branchlets. *Leaves* alternate, bifarious, petioled, binate, with a minute bristle between them. *Leaflets* sessile, of a shape between semi-cordate and reniform, entire, very smooth on both sides, while young tinged with red, slightly marked with three or four nerves, from one to three inches long, and a little more than half of that in breadth. *Petioles* round, smooth, about one-fourth or one-third the length of the leaves. *Stipules* small, cordate, caducous. *Panicles* terminal, and from the exterior axils, small, delicately slender, and smooth on every part. *Flowers* scattered, slender, pedicelled, small. *Bractes* minute, caducous. *Calyx* none, except the corol be so called. *Petals* five, obovate, concave, spreading, somewhat hoary on the outside; inside yellowish, rather longer than the stamens. *Filaments* ten, alternately shorter, inserted round the base of the germ. *Anthers* incumbent, ovate, with an acute point between the lobes. *Germ* oblong. *Style* ascending. *Stigma* large, peltate. *Legume* lanceolate, from two to three inches long, two-valved, striated lengthways, opening at the apex. *Seed* solitary in the apex of the legume, and there inserted, cuneate, furrowed; the posterior edge thin and somewhat membranaceous, no aril.

Some beautiful thriving young trees are in the Botanic garden at Calcutta, reared from seeds sent from the mountains of Coromandel by Dr. Berry of Madras, will soon enable us to know whether this tree produces any thing like the medicinal balsam *(Copaiva)* obtained from a tree which seems to be very nearly allied to it.

II. 425

2. H. *pinnata. R.*

Leaves alternately pinnate.

A tree a native of Travancore; the leaflets are about five in number, alternate, obliquely ovate-oblong, entire, firm and lucid.

NECTANDRA. Juss. gen.

Calyx inferior, tubular, from four to five cleft. *Corol* none. *Nectarial* scales from eight to ten from the mouth of the tube of the calyx, alternate with the stamina. *Germ* one-celled, one-seeded. *Berry* dry, one-celled. *Seed* solitary. *Embryo* inverse without perisperm.

N. *decandra. R.*

Leaves opposite, lanceolate, entire. Nectarial squamæ linear-clavate.

Herenda is the vernacular name in Silhet, where it has been found on only one hill, in the centre of an extensive jungle growing on the ruins of an old Hindoo place of religious worship, where the largest were elegantly bushy shrubs; flowering time October, the seed ripens in January, February and March.

Bark of the woody parts with small lighter coloured specks thickly scattered. *Branchlets* dichotomous, and much crowded. *Leaves* opposite, short-petioled, lanceolate, smooth, entire, finely veined; from two to three inches long, and less than one in breadth. *Floral leaves* sessile and coloured, in other respects like the common green leaves. *Peduncles* terminal, pretty long, smooth and slender, embraced generally above their base, by a pair of floral leaves, each bearing an erect umbellet of about six, pretty large, greenish white, fragrant flowers. *Pedicells* about as long as the flowers, and jointed a little below the middle; *no bractæ. Calyx* inferior, tubular, withering; *tube* rather gibbous, hairy within; *border* five-cleft; *segments* linear, and about as long as the tube. *Corol* none, but there ten clavate, abortive, filament-like bodies which originate from the mouth of the tube of the calyx, alternate with the true stamina. *Filaments* ten from the mouth of the tube of the calyx, twice as long as the *nectarial clubs*, and rather longer than the segments of the calyx. *Anthers* erect, ovate. *Germ* superior, oblong, remarkably hairy, one-celled, and containing one *ovula* attached to the top of the cell. *Style* the length

II. 426

of the *stamina*. *Stigma* large, round. *Berry* dry, roundish-obovate, size of a large pea, hairy, particularly the somewhat pointed apex, one-celled. *Seed* single, nearly round. *Integument* single. *Perisperm* conform to the seed. *Embryo* inverse, oval, lodged in the upper half of the perisperm. *Cotyledons* thick, semi-circular. *Radicle* conical, superior. Page Carey Ed.

QUISQUALIS. Schreb. gen. n. 739.

Calyx with filiform tube, and five-cleft border. *Petals* five. *Germ* inferior, one-celled; attachment superior. *Drupe* five-seeded.

1. Q. *villosa. R.*

Bractes ensiform. *Petals* obovate-cuneate.

Devee-moung, the vernacular name at *Rangoon.*

From Pegu this elegant, scandent, stout shrub has been sent to me by the Rev. Mr. F. Carey, and differs no doubt, from another species received from Amboyna, which I consider Q. *indica*, on account of the form of the bractes and greater degree of pubescence.

Leaves opposite, or nearly so, short-petioled, ovate-oblong, entire, somewhat acute, slightly villous; about three inches long, and nearly as broad. *Spikes* terminal, and axillary, solitary, villous. *Flowers* numerous, opposite and alternate, sessile. *Bractes* solitary, one-flowered, ensiform, villous. *Calyx* superior. *Tube* very long, and slender; widening considerably near its five-toothed mouth, somewhat villous on the outside. *Petals* five, obovate-cuneate, inserted into the mouth of the tube of the calyx, alternate with its segments, villous. *Filaments* ten, alternately shorter, inserted below the petals into the mouth of the tube of the calyx, and much shorter than they. *Anthers* oval, incumbent. *Germ* inferior, lanceolar, five-sided, villous one-celled with generally three, linear *ovula*, attached to the top of the cell, (exactly as in our *combretums*, *Pentapteræ* and *Terminaliæ*). *Style* blended in the tube of the corol, free at top only, where it emerges from the tube. *Stigma* clavate, perforated. II. 427

2. Q. *indica. Willd.* 2. 579.

Bractes oblong-ventricose. *Petals* oblong, very hairy.

Quis-qualis. *Rumph. Amb.* 5. *t.* 38.

A native of Amboyna, where it grows to be a large scandent shrub, with the young shoots very downy.

Leaves sub-opposite, short-petioled, from round-oval to oblong-cordate, entire, villous, their points triangular and acute. *Stipules* none. *Spikes* terminal, and axillary, villous. *Flowers* numerous, opposite, and alternate. *Bractes* solitary, one-flowered, rhombiform and ciliate. *Calyx. Tube* filiform, widening just below the five-cleft hairy mouth. *Petals* five, oblong-lanceolar, inserted on the mouth of the tube of the calyx, very hairy. *Filaments* ten, short, in two alternate rows round the mouth of the calyx. *Anthers* oblong, incumbent. *Germ* inferior, oblong, one-celled, and containing generally four *ovula*, attached to the top of the cell, as in the Pegu species, (Q. *villosa.*) *Style* united to the tube of the calyx until it reaches the stamina, where it separates, and ends equal with the anthers, in a large, three-sided, perforated stigma.

GETONIA. II. 428

Calyx one-leaved, five-parted, permanent. *Corol* none. *Filaments* inserted into the calyx. *Germ* inferior, one-celled, from two to three-seeded; attachment superior. *Seed* solitary, crowned with the remaining calyx.

1. G. *nutans. R.*

Panicles drooping. *Stamina* one-fourth the length of the calyx.

Found indigenous on the Rajmahl hills by Mr. William Roxburgh; in the Botanic garden at Calcutta it blossoms in February, March, and April. This genus differs from *Combretum* in the want of a corol only, for in some of the species of that genus, there are ten stamina.

Trunk short. *Branches* scandent, or even twining. *Bark* of the young shoots somewhat mealy; of the old and ligneous parts light grey, and pretty smooth. *Leaves* opposite, or nearly so, short-petioled, oblong, and ovate-oblong, entire, acuminate, drooping, while young villous; about six inches long and from two to three broad. *Stipules* none. *Panicles* terminal, and axillary, drooping, composed of several opposite, diverging downy spikes. *Bractes* very downy, lanceolate, one-flowered, shorter than the germ. *Calyx* superior subcampanulate, villous, permanent; *tube* very short; *borders* of five long spreading lanceolate, acute, three-nerved divisions. *Corol* none. *Filaments* ten, about one-fourth the length of the calyx, inserted on its tube. *Anthers* small, incumbent. *Germ* five-ribbed, one-celled, containing for the most part three seeds attached to the top of the cell. *Style* the length of the stamina. *Stigma* simple.

2. G. *floribunda. Roxb. Corom. pl.* 1 *pl.* 61. *t.* 87.

Panicles erect. *Stamina* as long as the divisions of the calyx. II. 429

Teling. Bandee mooroodoodoo.

A native of the Circars, flowering in February and March.

Note. Calycopterus. Lamark illust. gen. t. 357. is exceedingly like this, consequently like the former.

TERMINALIA. Schreb. gen. n. 1533.

Calyx five-parted. *Corol* none. *Germ* inferior, one-celled, two-seeded, attachment superior. *Drupe* one-seeded. *Embryo* inverse, spiral, no perisperm.

Page Carey Ed.

1. T. *procera. R.*

Branches horizontal, verticelled. *Leaves* cuneate, polished. *Racemes* axillary. *Corol* flat (*rotate.*) *Drupe* oblong, obscurely five-seeded, with the nut of the same shape.

This very charming species is a native of the Andaman Islands, where it grows to be a tree of the first magnitude. From thence it was introduced with many other plants, into the Botanic garden at Calcutta by Col. Alexander Kyd in 1794; and in 1809 they were about fifty feet high, with a slender, perfectly straight smooth trunk, and several verticells of perfectly horizontal branches; with bifarious, alternate branchlets. Flowering time in Bengal the month of March; the fruit ripens in July. Its leaves as in *Catappa*, drop about the beginning of winter in Bengal, and appear with the flowers in March.

Leaves crowded about the ends of the branchlets, short-petioled, cuneate; margins slightly waved, apex rounded, with a large rather obtuse point; perfectly smooth on both sides; veins parallel, and simple, with a small hairy bit in the axill of each, and two glands on the
II. sides of the nerve near the base; from eight to twelve inches long, and from four to five
430 broad. *Racemes* axillary, solitary, shorter than the leaves. *Flowers* numerous, small, pure white, the hermaphrodite ones are near the base of the raceme; the male ones farther in. *Calyx* salver-shaped (spreading flat without any tube.) *Stamens* alternately short, and incurved. *Germ* inferior, one-celled, containing two *ovula*, pendulous from the top of the cell. *Drupe* oblong, obscurely five-sided, but not in the least compressed, as in T. *Catappa*, which in most respects this species resembles very exactly, when ripe yellow. *Pulp* in large quantities, of a lively red colour and pleasant subacid taste. *Nut* in shape exactly like the drupe, but the five sides are better defined. *Embryo* with the thin cotyledons wrapped spirally round each other and the superior radicle.

2. T. *Catappa. Willd.* 4. 967.

Branches horizontal, verticelled. *Leaves* obovate. *Racemes* axillary. *Drupe* and *nut* compressed.

Catappa. *Rumph. Amb.* 1. *t.* 68.

Beng. Budam.

Adamaram. *Rheed. Mal.* 4. *t.* 3. 4.

Badamia. *Commersoni Gært. sem.* 1. *t.* 97.

Juglans *Catappa Lourier. Cochin Ch.* 703.

A most beautiful, large tree, found in gardens, &c. near towns and villages, where indigenous, I have not been able to ascertain. On the Coromandel coast it is in flower and fruit almost the whole year.

Trunk straight; *branches* verticelled, spreading horizontally like the different stages of that kind of compound table, called a dumb-waiter. *Branchlets* alternate, bifarious. *Bark* smooth, of a dark olive colour while young. *Leaves* about the extremities of the branchlets, subsessile, horizontal between obovate, and wedge form; *margins* a little scolloped; *apex* rounded, with a small obtuse point, smooth on both sides, having a large gland on each side of
II. the nerve near the base on the back, from six to twelve inches long. *Racemes* axillary, soli-
431 tary, simple, shorter than the leaves. *Flowers* numerous, small, dull-whitish colour. *Bractes* minute, falling.

MALE FLOWERS most numerous, scattered profusely over every part of the raceme, above the hermaphrodite. *Calyx*, &c. as in the genus.

HERMAPHRODITE FLOWERS a few below the male ones. *Drupe* oval, compressed, smooth, having the margin elevated with a groove on each side; when ripe, of a yellowish colour, *nut* oblong, with a rough surface. *Nucleus* linear-oblong.

The kernels are fully as palatable as the best filberts, or even almonds, and I have every reason to think they are equally wholesome, and nutritive. The tree is highly ornamental, few surpassing it in elegance and beauty. The wood is also useful.

3. T. *belerica. Corom. pl.* 2. *N.* 198.

Leaves crowded about the extremities of the branchlets, long-petioled, oval, with smooth glands on the petioles. *Spikes* axillary, simple. *Calyx* campanulate. *Drupe* oval, downy.

Sans. Vibhituka.

Beng. Buhira.

Arab. Be-ley-luj.

Pers. Be-ley-leh.

Tam. Tandra marum.

Tani. *Rheed. Mal.* 4. *t.* 10.

Teling. Toandee.

Myrobalana. *Belerica. Gært. sem.* 2. 90. *t.* 97. *M. M. &c.*

It is a native of the mountainous parts of the Circars, growing to be one of the largest trees, with an erect trunk, and a very large spreading head. Flowering time the beginning of the hot season.

II. *Leaves* crowded about the extremities of the branches, petioled, oval, entire, firm, smooth;
432 six or seven inches long, and two and a half broad. *Petioles* round, from two to three inches long, with two opposite glands on the upper side of the apex, and sometimes near the base. *Spikes* axillary, solitary, simple, erect. *Flowers* small, of a dirty grey colour. The *male* flowers towards the apex of the spike, the *hermaphrodite* ones below. *Calyx*, *stamens*, and *pistillum* as in the genus. *Drupe* oval, somewhat pentagonal, the size of a nutmeg, fleshy, covered with a grey silky down. *Embryo* inverse, &c.

The kernels of the fruit are eaten by the natives; they taste like filberts, but are reckoned intoxicating, when eaten in any quantity. Hereabouts they do not use any part of the

fruit in medicine, so far as I can learn. Page Carey Ed.

Wood white, rather soft, durable and seldom used. From wounds in the bark, large quantities of an insipid gum issues, it much resembles *Gum arabic*, is perfectly soluble in water, burns away in the flame of a candle, with little smell, into black gritty ashes.

The flowers have a strong offensive smell, not unlike those of *Sterculia fœtida*.

4. T. *moluccana. Willd.* 4. 968.

Leaves alternate, short-petioled, oblong, entire, smooth, without glands. *Spikes* axillary. *Flowers* rotate. *Drupe* obovate, villous.

Sans. Kala Drooma.

The dry fruit of this tree, of which there are two varieties, a larger and a smaller, both growing in this garden are so very like the real *Beleric myrobalans*, the produce of my *Terminalia Belerica. Corom. pl.* 2. *N.* 198. as to be sold by the native druggists as such, under the Hindoo name *Bohura*, which is their name for that drug. The trees which produce the above-mentioned large, and smaller sorts, are exactly alike in every other respect except in the size of the fruit. They are natives of the various mountainous countries North East of Bengal. II.

In this garden they blossom in April and May, and ripen their seed the following March. 433

Trunk straight. *Branches* sub-verticelled, horizontal. *Bark* pretty smooth, and of a dark brown colour, height of the whole tree about fifty feet. *Leaves* alternate, short-petioled, oblong, obtuse, entire, smooth on both sides, beautifully reticulated with minute veins, while young coloured and villous, from two to twelve inches long, and broad in proportion. *Petioles* scarcely one-fourth the length of the leaves, round, smooth, without glands, and this is the only species of the genus, I have yet met with, that is so, and in this it differs from T. *belerica*. *Spikes* axillary, solitary, shorter than the leaves. *Flowers* numerous, of a dull yellowish brown colour, and rather offensive smell. *Male* towards the apex, and the *hermaphrodite* below. *Calyx* flat, with the apices of the five divisions revolute, villous on the outside, and woolly within. *Filaments* ten, twice or more longer than the calyx. *Germ* and *style* in the male small, and abortive, in the hermaphrodite larger and longer. *Drupe* round-obovate, somewhat villous, size of a large nutmeg. *Nut* the shape of the drupe, slightly five-grooved, from the apex to the base.

For some time I gave this species the trivial name *eglandulosa;* a specimen so named must have fallen into Willdenow's hand to have enabled him to quote me for that name. *See his edition of the species, vol.* 4. *p.* 968.

5. T. *chebula. Willd.* 4. 969.

Leaves sub-opposite, oblong, villous underneath, glands on the margins and petioles. *Spikes* terminal, often panicled. *Drupe* oval, smooth.

Sans. Haritaka.

T. *chebula. Retz. obs.* 5. 31. *Corom. pl.* 2. *N.* 197. *Asiat. Res.* 11. *p.* 181.

Myrabolana *chebula. Gært. sem.* 2. 91. *t.* 97.

M. *Indica* and *Chebula. Hills. M. M. p.* 500. 1. II.

Hur, Harua, Hindoo names of the *chebulic myrabolans.* 434

Teling. and *Tam.* Kadukar.

Zengi, or Zunguhar, the black or Indian myrabolans, and for the Asiatic synonyms of the other varieties, see Dr. Fleming's paper at page 181, in the 11th. volume of the Asiatic Researches above quoted.

A large tree, a native of the forests of India, from Cape Comorin, to the mountains which bound the plains of Bengal, Oude, &c. on the north. Flowering time in Bengal, the hot season. The seed ripens in November and December.

Trunk rarely straight, and but short for the size of the tree. *Bark* in young trees of about seven or eight years growth, of a light ash-colour and slightly cracked, their trunks are then from two to three feet in circumference, three feet above ground. *Branches* many, spreading much in every direction, their extremities often drooping, and while young downy. *Leaves* opposite, or nearly so, short petioled, oblong, entire, obtuse, while young very downy on both surfaces, but when old underneath only, some small glands in the margins near the base, and generally two on the edges of the downy petioles near the apex, about six inches long and three broad. *Stipules* none. *Spikes* in a terminal panicle, or axillary, and there generally undivided, downy. *Flowers* numerous, small, dull white, smell offensive, (as in most, if not all, the other species,) all hermaphrodite. *Bractes* solitary, subulate, downy, one-flowered. *Calyx* bowl-shaped, five-toothed, very hairy, particularly the inside, and five very hairy glands in its bottom, surrounding the base of the style. *Filaments* ten, alternately a little shorter, twice the length of the calyx. *Anthers* small, oval. *Germ* inferior, oval, hairy, one-celled, containing two *ovula* attached to the top of the cell. *Style* rather shorter than the stamina. *Stigma* acute. *Drupe* oval, about an inch and a half long, and about one inch in diameter, smooth, of a pale greenish yellow, very obscurely five-angled, one-celled. *Pulp* in considerable quantity, hard and yellowish. *Nut* oblong, thick and very hard, with surface rough, the irregularly and obscurely five-grooved, one-celled. *Seed* solitary, lanceolate. *Integument* membranaceous. *Perisperm* none. *Embryo* conform to the seed, inverse. *Cotyledons* thin, and large, and spirally rolled up round each other, and the lower part of the cylindric, superior *radicle.* II. 435

The tender leaves, while scarce unfolded, are said to be punctured by an insect, and its eggs deposited therein, which by the extravasation of the sap, become enlarged into hollow galls of various shapes and sizes, but rarely exceeding an inch in diameter. They are powerfully astringent, and make as good ink as oak galls. They also yield the chintz painters an

Page Carey Ed. the Coast of Coromandel, their best and most durable yellow. They are called by the Tamuls *Kadu kai*, and by the Telingas *Aldicai*, and are very like the *Faba Bengalensis* of our Materia Medica.

6. T. *citrina. Roxb.*

Leaves sub-opposite, oblong, with a tapering base, smooth, acute, having two small glands on the apex of the petiole. *Panicles* terminal and axillary. *Nut* five-winged. Myrabolanas *Citrina. Gært. sem.* 2. 91. *t.* 97.

A very large, and tall timber tree, a native of the various extensive forests on the eastern frontier of Bengal where it is called *Hurituki ;* it blossoms there in April and May, and the seed ripens in November.

The fruit of this, like that of T. *chebula*, is an article of import in Hindoo Materia Medica and generally, I believe, pass under the same name, so much alike are they, and for
II. the most part employed as gentle purgatives.
436 *Trunk* straight, and of very great size. *Branches* spreading, but not much crowded, *Bark* rather scabrous that of the *young shoots* strongly marked with light coloured, elevated specks ; wood much like mahogany, but finer grained ; a beautiful specimen sent to me by Mr. Smith of Silhet, was accompanied with the following words :—

" This piece of wood is from a tree which I bought ; it was eighty feet long, one straight " body or trunk, and was nine feet in circumference. This wood is very hard, no insect will " touch it."

Leaves sub-opposite, short-petioled, from broad-lanceolar to oblong, tapering less at the base than at the apex, entire, rather obtusely acuminate, smooth and glossy on both sides, from four to six inches long, and from two to three broad ; when the plants are young the leaves are villous. *Panicles* terminal, and from the exterior axills, composed of many, simple, erect, slightly villous spikes. *Flowers* numerous, small, of a dull yellow, all hermaphrodite. *Bractes* solitary, one-flowered, subulate, smooth. *Calyx* cup-shaped, five toothed, hairy on the inside, five, very hairy glands having at the bottom round the base of the style. *Filaments* ten, alternately shorter, but all much longer than the calyx, and inserted into its inside. *Anthers* oval. *Germ* inferior, one-celled containing two *ovula* attached to the top of the cell. *Style* shorter than the stamina, smooth. *Stigma* acute. *Drupe* oblong-lanceolar, about two inches long, and two in circumference where thickest, while fresh obscurely five-cornered but more clearly so when dry, of a dull orange yellow, and smooth. *Nut* oblong, deeply five-grooved, with the five angles sometimes sharp, sometimes rounded, one-celled. *Seed* solitary, linear-lanceolar. *Integument* single, thin, of a light brown. *Perisperm* none. *Embryo* inverse. *Coty-*
II. *ledons* two, thin, and broad, rolled spirally up. *Radicle* superior.
437 7. T. *angustifolia. Willd.* 4. 970.

Tender parts hairy. *Leaves* narrow-lanceolate, acuminate ; glands on the margin of the base.

Tam. Morgatchee.

A large tree, a native of Tinnivalle and Travancore. It has now been four years in the Botanic garden at Calcutta, in which time they have attained to the height of ten and twelve feet, but have not blossomed. The young leaves are clothed with much ferruginous hair. The fruit so much like the *chebula* myrabolans, as scarcely to be distinguished from it, and they possess the same sensible qualities.

8. T. *gangetica. R.*

Tender parts villous. *Leaves* opposite, and alternate ovate-oblong, acuminate, base abruptly rounded and has some glands in the margin.

A tree, a native of the banks of the Ganges, where it blossoms and ripens its fruit. It is also like the *Chebula myrabolans*, goes by the same general name, Hur or Hura, and is used for the same purposes, so that it is difficult to say which of the last three species deserves most to have the specific name *Chebula* attached to it.

PENTAPTERA. R.

Calyx bowl-shaped, five-toothed. *Corol* none. *Germ* one-celled, *ovula* from two to three, pendulous. *Nut* inferior, woody, five-winged. *Seed* single. *Embryo* inverse, without perisperm, and the two cotyledons spirally rolled up.

1. P. *angustifolia. R.*

II. *Bark* smooth ; *branches* drooping. *Leaves* sub-opposite, from lanceolar to linear oblong,
438 smooth, having two sessile glands at the base, on the margins of the short petiole where it joins the leaf and which are equally conspicuous viewed on either surface. *Spikes* terminal, sub-panicled.

A stout timber tree, a native of the Balla-ghaut mountains. Flowering time in the Botanic garden at Calcutta in April and May ; the seed ripens about the close of the year.

2. P. *Arjuna. R.*

Bark smooth. *Branches* horizontal. *Leaves* sub-opposite, linear-oblong, with over unequally cordate base, smooth, having two sessile glands underneath the base, and not visible when looking at the upper surface of the leaf.

Sang. Urjoona, also Kukooubha.

Hind. Cahua.

Beng. Urjoon.

A stout quick growing timber tree, a native of various parts of India. It flowers in April and May, and the seed ripens about the close of the year. The margins of the leaves are often

slightly crenulate, and the two glands underneath the base are only conspicuous on the under side, whereas in P. *angustifolia*, which this resembles most, they are equally conspicuous in viewing either surface. Page Carey Ed.

3. P. *crenulata. R.*

Bark remote. *Leaves* sub-opposite, oblong, acute, crenulate, smooth, one or two cyathiform glands on the rib, far above the base.

A large timber tree, a native of Coromandel. It flowers in April and May.

4. P. *coriacea. Roxb.* II.

Leaves sub-opposite, short-petioled, oval, with a cordate base, hard above, hoary underneath, having one or two sessile, turbinate glands at or near the base of the nerve. *Spikes* panicled, terminal and axillary. *Nut* hoary. 439

Tam. Anemui marum.

A timber tree of considerable size, a native of the mountains of Coromandel. It flowers in July. It is nearly allied to *Pentaptera* tomentosa, (which was formerly called *Terminalia alta tomentosa.)* The chief marks of distinction are to be found in all the tender parts, except the hard upper surface of the leaves, that being in this very hoary; the leaves are shorter, broader, and more cordate at the base; the glands sessile, and the nut soft with hoary pubescence.

Trunk tolerably erect. *Bark* ash-coloured, and deeply cracked, even in young trees. *Branches* spreading, with the extremities often drooping, and downy. *Leaves* sub-opposite, short-potioled, oval with a cordate base, and one side generally extending further down on the petiole than the other; obtuse or emarginate, entire, hard, on the upper surface, except while very young hoary and soft underneath, about five or six inches long, and four broad. *Glands* near the base of the rib, or nerve, either one or two, when two they are on opposite sides; turbinate and sessile. *Panicles* terminal, and from the exterior axills, composed of a few, simple, long, cylindric, hoary spikes. *Flowers* sessile, all hermaphrodite, crowded, small, of a dull yellow, with the outside hoary. *Bractes* solitary, one-flowered, linear, the length of the germ, hoary. *Calyx* five or six cleft, hoary without, and very hairy within. In the bottom, round the insertion of the style, are five or six glands, which are so very completely covered, as to seem a tuft of hair only. *Filaments* ten or twelve, much longer than the calyx. *Germ* round, one-celled, containing two *ovula* attached to the top of the cell, immediately under the style; about as long as the stamina. *Stigma* simple. *Nut* linear-oblong, enlarged with five, very broad, hard, thin, hoary wings, one-celled, size nearly two inches each way, wings included for the diameter of the nut itself, is less than half an inch. *Seed* solitary, linear-lanceolate, acute at both ends. *Perisperm* none. *Embryo* inverse straight. *Cotyledons* two, thin, wrapped spirally round the superior, sub-cylindric *radicle* and each other. II. 440

Dr. Andrew Berry, of Madras, who is acquainted with the tree in its native soil, has furnished the following information:

"It is a native of the inland mountains of Coromandel, chiefly those of the western parts. The bark is very thick, and deeply cracked, outwardly of a dark grey colour, inwardly red like dragon's blood. The trunk straight and lofty; wood of considerable diameter, so as to be made into solid wheels for buffalo carts; strong, hard, and heavy.

5. P. *tomentosa. Roxb.*

Bark deeply cracked. *Leaves* sub-opposite, linear-oblong, downy with some turbinated pedicelled glands on the rib near the base.

Sans. Usna, Peeata-saluka.

Hind. Aans.

Beng. Peea-sal, or Usan.

Teling. Nella-madoo.

Found in various parts of India, grows to be a large timber tree of much utility. Flowering time April and May, the seed ripens in the cool season.

6. P. *glabra. R.*

Bark smooth; *branchlets* drooping; *leaves* sub-opposite, narrow, oblong, smooth with some sub-pedicelled, umbilicate *glands* towards the base of the rib.

Teling. Tella-madoo. II.

A timber tree, a native of various parts of India. It flowers in May and the seed ripens in the cool season. 441

7. P. *bialata. R.*

Arboreous. *Branches* horizontal. *Leaves* alternate, cuneate-oblong, waved, pointed, polished. *Spikes* axillary, drooping. *Drupe* two-winged.

Of this very distinct species, there is a large one in the Botanic garden which blossoms about the beginning of the rains. It is a native of the mountainous parts of India.

Trunk perfectly straight, even up through the horizontal subverticelled branches to the very top; it is from five to six feet in circumference four feet above ground. *Bark* smooth, of a greenish ash colour; the height of the whole tree about fifty feet. *Leaves* alternate, about the ends of the branchlets, long-petioled, oblong-cuneate, entire, acute, with waved margins, smooth, polished, of a deep green on both sides, from four to seven inches long, and from two to three broad. *Petioles* about half the length of the leaves, very smooth, the lower half being round, and the upper half flattened on the upper side. *Spikes* axillary, solitary, smooth, drooping, about as long as both leaf and petiole. *Flowers* numerous, small, of a greenish yellow, hermaphrodite in the lower half of the spike, and male in the rest. *Bractes* minute, one-flowered, caducous. *Calyx* campanulate, five-parted, having the bottom filled with brown hairs. *Filaments* ten, alternately a little shorter, the short ones do not expand so much as the longer five.

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Anthers two-lobed. *Germ* beneath, ovate, villous. *Style* nearly as long as the stamina. *Stigma* acute. *Drupe* oblong, villous, tapering equally towards each end, and enlarged with two broad, membranaceous, waved, villous wings. *Seed* lanceolate. *Embryo* with its two large thin *cotyledons*, rolled spirally up round each other and the superior *radicle*.

8. P. *paniculata. R.*

Branches diverging. *Leaves* sub-opposite, linear-oblong, with a cordate base, entire, smooth, but very hard; there are two sessile umbilicate glands underneath the base. *Panicles* terminal. *Nuts* unequally three-winged.

Tam. Pe-karakai.

Teling. Neemeeri.

A stout timber tree, a native of the peninsula, and from thence introduced by Dr. A. Berry into the Botanic garden at Calcutta, where, in eight years, from the seed the young trees began to blossom in December, and the seed ripened in May, they were then about twenty feet high, and the stems eighteen inches in circumference at four feet above the ground.

CONOCARPUS. Schreb. gen. n. 321.

Flowers aggregate. *Receptacle, common*, globular, that of the corollets columnar raising them above the germ. *Calyx* bowl-shaped, five-toothed. *Corol* none, or five-petalled. *Stamina* five or ten. *Seeds* naked, inferior.

1. C. *latifolia. Roxb.*

Leaves obovate, sub-retuse. *Peduncles* ramous; *corollets* apetalous, decandrous.

Teling. Sheriman.

This is one of the largest timber trees that is to be found amongst the chain of mountains, which separate the Circar from the Mahratta dominions, where it is a native. It flowers during the cold season, January and February.

Trunk erect, straight, varying in length and thickness, the largest are thirty or thirty-five feet to the branches, and about six in circumference. *Bark* pretty smooth, of a light ash colour. *Branches* numerous, spreading, forming a large, high, ever green head. *Leaves* nearly opposite, short-petioled, ovate, generally emarginate, entire, smooth, from one to four inches long, and from one and a half to two broad. *Peduncles* axillary, short, round, smooth, ramous, each ramification supporting a little globular head, of small yellow corollets. *Calyx, common perianth* scarcely any, a globular common receptacle unites the corollets, with which it is every where covered. No *proper perianth. Corollets* supported upon columnar, partial pedicels, one-petalled, imperforated, five-cleft; *segments* acute, erect, with the bottom woolly. *Filaments* ten, twice the length of the corollets, erect, inserted into the mouth of the tube. *Anthers* oblong, lower, bifid. *Germs* inferior, sessile, compressed, ending in the pedicel of the corollet, which is permanent, and looks like a remaining stile. *Style* awled, rather shorter than the stamen. *Stigma* acute. *Pericarp* none. *Seeds* single, oblong, perpendicularly surrounded with a rigid, narrow ring. *Receptacle* globular, a little scaly.

II. 443

2. C. *acuminata. R.*

Leaves oval, pointed. *Panicles* undivided; *corollets* apetalous, decandrous.

Teling. Paunchinan.

This second species is also a large timber tree, a native of the same places. It flowers during the cold season.

Trunk equally high with that of the preceding species, but seldom or never straight. *Bark* ash-coloured. *Branches* very numerous, spreading, with their extremities pendulous like the weeping *willow*, the whole forming a most beautiful, large, regular, ever-green top. *Leaves* nearly opposite, short-petioled, oblong, pointed, entire; when young downy; when old smooth, about two inches long, and one broad. *Peduncles* axillary, single, simple, undivided; each bearing one small globular head of small yellow corollets.

II. 444

These trees are valuable on account of their wood, particularly the first, *Shereman;* its timber is universally esteemed for almost every economical purpose. Towards the centre it is of a chocolate colour, and is then exceedingly durable. For house and ship building, the natives reckon it superior to every other sort, *Pentaptera tomentosa*, and teak expected.

The wood of Paunchinan is exceedingly like, and fully as strong, and as durable, if kept dry, as the former, but exposed to the water, it soon decays; of course it is unfit for the Marine yard, but equally fit for house building when it can be obtained straight, which is seldom the case.

DECANDRIA DIGYNIA.

TRIANTHEMA. Schreb. gen. n. 762.

Calyx two leaved, or none. *Corol* five-cleft, or five-petalled, daggered under the top. *Capsule* inferior, circumcised.

1. T. *crystallina. Willd.* 2. 635.

Perennial. *Stems* filiform, prostrate, in fact cespitose, dotted with crystalline specks. *Leaves* opposite, broad-lanceolate. *Flowers* single, or in pairs in the forks of the branchlets, pentandrous, monogynous. *Seed* solitary.

Teling. Kooka pal koora.

A native of Coromandel. It flowers during the rainy and cold season.

2. T. *decandra. Willd.* 2. 636.

Prostrate. *Leaves* elliptic. *Peduncles* many-flowered. *Stamina* from eleven to twelve. *Styles* two. *Capsules* four-seeded. Page Carey Ed.

Teling. Tella galgeroo.

Hind. Gada-buni.

Zallia *Decandra. Birm. Ind.* 110. *t.* 31. *f.* 3.

A common weed in gardens in most parts of India, and in flower and seed great part of the year. II.

3. T. *obcordata. R.* 445

Stems prostrate. *Leaves* opposite, alternately, larger and obcordate, smaller and oblong. *Flowers* solitary. *Stamens* from fifteen to twenty. *Style* single. *Capsules* many-seeded.

Swet-sabuni the Hindee name of the pale variety, and Lal-sabuni the reddish.

Teling. Yurra-galjeror, or Bodo-pail-kura.

It delights in old gardens, rubbish, &c. It flowers all the year round.

Root long, perennial. *Stems* many, diffuse, dichotomous, round, jointed, coloured, a little downy on the upper side. *Leaves* opposite, petioled, obcordate, smooth, waved, with a reddish margin, alternately smaller, the large one being more than an inch each way, and the smaller one less than an inch long and narrow. *Petioles* winged, concave, uniting and clasping the stem, forming a cup with two lateral stipulary, or calyx like processes for the flower. *Flowers* solitary, sessile in the divisions of the branches. *Calyx* no other than the processes of the united petioles. *Corol* as in the genus. *Stamens* from fifteen or twenty in our Indian plant. *Germ* totally superior, turbinate. *Style* single, shorter than the stamens. *Capsule* oblique truncate, circumcised. *Seeds* many, reniform, black, rough. *Receptacle* a line running along the upper side of the bottom of the capsule.

The leaves and tender stops are eaten by the natives.

SAPONARIA. Schreb. gen. n. 769.

Calyx tubulous, naked, five-toothed, permanent. *Corol* of five, long-clawed petals. *Capsule* superior, one-celled. *Seeds* many.

S. perfoliata. R. II.

Calyces gibbous, five-keeled. *Stem* erect, two-forked. *Leaves* perfoliate, three-nerved, sublinear, panicles terminal, dichotomous; apices of the petals notched. 446

A native of Bengal, appearing during the cold season. It has the habit of *Gypsophila perfoliata.*

DIANTHUS. Schreb. gen. n. 770.

Calyx cylindric, one-leafed; at the base four scales. *Petals* clawed. *Capsule* superior, cylindric, one-celled.

1. D. *chinensis. Willd.* 2. 677.

Flowers solitary. *Scales* of the calyx subulate, expanded, as long as the tube. *Petals* crenate. *Leaves* lanceolate.

A native of China, but succeeds well during the cold season in Bengal.

2. D. *Caryophyllus. Willd.* 2. 674.

Flowers solitary. Scales of the calyx ovate, acute, short. *Petals* crenate, beardless.

Pers. Gool Karunphool.

A native of Persia, and succeeds during the cool season in Bengal.

DECANDRIA TRIGYNIA.

SILENE. Schreb. gen. n. 772.

Calyx one-leafed, ventricose, five-toothed. *Petals* five, entire, or bifid, unguiculate, crowned with the nectarium. *Capsule* incompletely three-celled. *Seeds* numerous. *Receptacle* columnar.

S. indica. R.

Leaves stem-clasping, lanceolar. *Flowers* terminal. *Calyx* ventricose, ten-angled, with five short teeth. *Petals* bifid, with a toothlet on each side near the nectary. *Capsule* ovate-oblong, one-celled. II. 447

A native of Nepaul. It flowers during the cold season in the Botanic garden at Calcutta.

ARENARIA. Schreb. gen. n. 774.

Calyx five-leaved. *Petals* five, entire. *Capsule* one-celled, many-seeded.

A. flaccida. R.

Annual, flaccid, jointed, smooth, dichotomous. *Leaves* in opposite fascicles, filiform, the length of the joints. *Flowers* panicled. *Calyces* rather obtuse. *Capsules* globular. *Seed* reniform, compressed, ringed.

This plant greatly resembles *spergula arvensis,* and probably may be a variety of that plant. It is only found during the cold season as a weed in gardens about Calcutta, and may have been accidentally introduced from Europe.

Page Carey Ed.

HIRÆA. Schreb. gen. n. 781.

Calyx five-leaved. *Corol* five-petalled. *Germ* superior, three-celled; cells one-seeded; attachment interior. *Seeds (Samara)* three, each with a large membranaceous wing on each side. *Embryo* inverse, without perisperm.

1. H. *nutans. R.*

Shrubby, twining. *Leaves* simple, ovate ventricose, entire, acuminate. *Panicles* terminal, drooping. *Samara* elliptic.

An extensive, twining, shrubby species, a native of the interior parts of Bengal. It flowers in August and September, the seed ripens in November and December. *Stems* ligneous,
II. and with their extensive branches, twining up and over trees of considerable size. Bark of the
448 old woody parts dark brown, and pretty smooth; *young shoots* pendulous, round, and clothed with closely appressed hairs. *Leaves* opposite, petioled from ovate to cordate, entire, tapering much toward the acute apex, having the upper surface glossy, with a few appressed hairs, and the under paler and more hairy, from four to eight inches long, and from two to five broad. *Petioles* round, hairy, from one to two inches long. *Stipules* minute, subulate, pointed. *Panicles* terminal, and axillary, pendulous, large, composed of many, opposite, diverging, simple or compound racemes, and like the other parts clothed with appressed brown hairs. *Bractes* lanceolate, conic; those of the ramifications solitary, those of the pedicel tern. *Flowers* numerous, opposite, small, yellow, inodorous. *Calyx* five-parted; *segments* equal, oblong, obtuse. *Petals* five, oblong, sessile, expanding; mamelliferous pores. *Filaments* ten, shorter than the petals, base broad and slightly united, inserted into the receptacle round the germ. *Anthers* oblong, erect. *Germ* superior, three-celled, with one *ovula* in each, attached to the axis. *Styles* three, length of the stamina. *Stigma* headed. *Samara* three, united, singly linear, and surrounded with a very large entire reticulate, scarious, elliptical wing, one-celled, evalvular. *Seed* solitary, linear, attached near the apex to the inside of the cell. *Integuments* single, thin, brown. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, equal, linear. *Radicle* ovate, superior.

2. H. *indica. R.*

Shrubby, climbing. *Leaves* opposite, ovate, entire. *Panicles* axillary and terminal. *Samara* linear.

Teling. Regrak tiga.

A native of the Circar mountains.

II. 3. H. *rotundifolia. R.*

449 Shrubby, twining. *Leaves* orbicular, entire, villous underneath. *Panicles* axillary, thin, villous. *Samara* orbicular with a small wing on the back.

An extensive perennial, woody rambler, a native of Chittagong. It flowers in March and April.

ERYTHROXYLON. Schreb. gen. n. 783.

Calyx five-toothed. *Corol* five-petalled with emarginate scales over the base on the inside. *Nectary* campanulate divided into ten antheriferous filaments. *Germ* superior, three-celled; attachment superior. *Drupe* one-seeded. *Embryo* inverse, furnished with a perisperm.

1. E. *monogyum. R. Corom. pl.* 1. *p.* 61. *t.* 88.

Leaves subsessile, cuneate, entire. *Stipules* conic acute. *Flowers* axillary, one or two. *Style* single. *Stigmas* three. *Drupe* oblong.

Teling. Adivi gerenta.

2. E. *sideroxyloides. Lamark Encycl.* 2. *f.* 390. *Willd.* 2. *f.* 748.

A native of Coromandel, Ceylon, &c. It flowers during the greater part of the year.

From Ceylon General Macdowall sent it to the Botanic garden at Calcutta, under the name of the Fen tree.

3. E. *laurifolium. Willd.* 2. 749.

Arboreous. *Leaves* short-petioled, oblong, obtuse, lucid. *Peduncles* axillary, crowded, longer than the flowers. Nectarial scales with truncate, porous apices. *Stamina* monodephous.

Found by Colonel Hardwicke indigenous on the Mauritius in flower in August.

II. 450

DECANDRIA PENTAGYNIA.

AILANTHUS. Schreb. gen. n. 167.

Polygamous. *Male calyx* five-toothed; *corol* five-petalled.

Hermaphrodite calyx and *corol* as in the male. *Germ* from three to five. *Capsules* (Samara) from three to five, one-seeded.

A. *excelsa. Willd.* 4. 974. *R. Corom. pl.* 1. *N.* 13.

Leaves abruptly pinnate; *leaflets* twelve pair, petioletted, opposite, broad-falcate-lanceolate, grossly serrate.

An immense tree, a native of the interior of Coromandel. It flowers during the cold season. The wood is white and soft, consequently of little use.

Page Carey Ed.

AVERRHOA. Schreb. gen n. 784.

Calyx five-leaved. *Corol* five-petalled, campanulate. *Germ* superior, five-celled cells; few-seeded; attachment interior. *Pomum* angular, five-celled. *Embryo* inverse and furnished with a perisperm.

1. A. *Carambola. Willd.* 2. 750.

Pomum oblong, acute-angled. *Leaflets* ovate.

Tamara touga. *Rheed. Mal.* 3. *t.* 43. *and* 44.

Sans. Karmarunga.

Hind. and *Beng.* Kamarunga.

Native place uncertain, but common in gardens all over India. There are two varieties; one producing a sweet, the other a sour fruit. In Bengal both blossom during the rainy season, and the fruit ripens during the cool months of December and January. II.

2. A. *bilimbi. Willd.* 2. 749. 451

Leaves pinnate, many paired; *leaflets* ovate-lanceolate. *Fruit* oblong, obtuse-angled.

Bilimbi. *Rheed. Mal.* 3. *t.* 45 *and* 46.

Blinbingun teres. *Rumph. Amb* 1. *t.* 36.

This pretty little tree I have only found in a cultivated state; where it is indigenous I cannot say. In Bengal it is uncommon; and in the Botanic garden flowers in March and April, and the fruit ripens in about two months. For the uses of the fruit of these two species I refer to Rumphius.

SPONDIAS. Schreb. gen. n. 784.

Calyx five-toothed. *Corol* five-petalled. *Germ* superior, five-celled; cells one-seeded; attachment superior. *Drupe* with a five-celled nut. *Seed* solitary. *Embryo* inverse, without perisperm.

1. S. *mangifera. Willd.* 2. 751.

Leaflets four or five-pairs, oblong, mucronate. *Panicles* diffuse. *Nut* oblong, nearly smooth on the outside.

Ambalam. *Rheed. Mal.* 1. *t.* 50.

Amrataca. *Asiat. Res.* 4. *p.* 284.

Hind. and Beng. Amra.

Teling. Amatum.

Ponastia. *Juss. Genera. plant.* 410.

Spondius *amara. Lamark Encycl.* 4. *p.* 245.

Mangifera *pinnata. Linn. suppl. plant. p.* 56.

This is a large tree, amongst the mountains of Coromandel, but in gardens where it is frequently found cultivated, it is of a smaller size, and low. Flowering time the beginning of the hot season, when the leaves come out. The fruit ripens during the cold season, and then its leaves are deciduous. II.

Trunk straight, in our gardens from one to two feet in diameter. *Bark* smooth, ash-coloured, astringent. *Branches* nearly horizontal. *Leaves* alternate about the extremities of the branches, pinnate with an odd one, from twelve to twenty inches long. *Leaflets* about five pair, opposite, oval, pointed, entire, smooth, veined; from three to six inches long, and two or two and a half broad. *Petioles* round, smooth. *Stipules* none. *Panicles* terminal, very large, diffuse, and thin. *Flowers* very numerous, small, white, mostly barren, though no male flower (apparently so) is to be found. *Calyx* below, small, five-toothed. *Petals* five, oblong, spreading. *Nectary* a large fleshy notched ring surrounding the germ. *Filaments* ten, awled, alternately shorter, incurved, scarcely half the length of the petals. *Anthers* small. *Germ* ovate, five-celled with one *ovula* in each, attached to the top of the axis. *Styles* five, short, erect, distant. *Stigmas* simple. *Drupe* oval, fleshy smooth, the size of a pullet's egg, when ripe, yellow. *Nut* oblong, woody, very hard, outwardly fibrous, five-celled, but seldom more than one, two or three of them produce seed. *Seed* lanceolate. *Embryo* inverse, without perisperm. 452

The wood of this tree is soft, and of little or no use. From wounds made in the bark, about the beginning of the hot season, very large quantities of a transparent juice issues, which soon hardens into a mild insipid gum, exactly like gum arabic.

The fruit is eaten raw when ripe, and before ripe is pickled, put in curries, made into tarts, &c. &c.

2. S. *dulcis. Willd.* 2. 752.

Leaves from six to seven pair, oblong, serrulate. *Panicles* terminal. *Nut* round, armed.

S. *cytheria. Lamark. Encycl.* 4. 245. *Gært. sem.* 2. 101. *t.* 103. *Sonnerat.* 2. 222. *t.* 123. II.

A native of the Society Islands, and now common in the Botanic garden at Calcutta where it grows to be a large tree with an extensive, very ramous head. Flowering time in Bengal, March; the fruit ripens about the close of the rains. 453

3. S. *acuminata. R.*

Leaflets from five to eight pair, subopposite, long, oval, remotely crenulate, acuminate, polished; *petioles* cylindric.

A most elegant, middling-sized tree, with an uncommonly dense crown, a native of Malabar. In the Botanic garden at Calcutta young trees reared from the seed, were in four years twenty feet high; the *trunk* perfectly straight; the *bark* smooth, olive grey; the *branches* spreading in all directions from erecto-patens above, to divaricate below.

Page Carey Ed.

4. S. *longifolia. R.*

Bark verrucose. *Leaflets* opposite and alternate, from ten to twelve pair, very unequally ovate-oblong, entire, lucid, obtusely acuminate.

From the Mauritius this very distinct species has been introduced into the Botanic garden at Calcutta, where its growth is rapid; it is nearly straight, with a few stout, patently diverging, almost simple *branches*, very rough with brown tubercles; the leaflets very unequally divided by the nerve.

5. S. *axillaris. R.*

Leaflets from six to eight pair, ovate-lanceolate, gash-serrate cuspidate. *Peduncles* axillary, few-flowered. *Nut* oval, smooth.

A small beautiful *Melia* looking tree, a native of Nepal. In the Botanic garden at Calcutta it flowers in March, and the seed ripens about the close of the rains.

II. 454

CNESTIS. Juss.

Calyx five-leaved (five-parted, Juss.) *Corol* five-petalled. *Germ* five, superior, one-celled, one-seeded; attachment inferior. *Capsules* from one to five, one-celled, one-valved (two-valved, Juss.) *Seeds* solitary, attached to the base of the cell. *Embryo* inverse, without perisperm.

C. *monadelpha. R.*

Shrubby. *Leaves* pinnate; *leaflets* five or seven, sub-alternate, oblong, obtuse, acuminate, polished. *Panicles* axillary, crowded. *Filaments* united at the base.

Sookurtothee of the Hindus about Silhet, where the shrub grows. It is also found on the hills of Chittagong, and there called *Kowatothee;* the natives eat the fresh aril of the ripe seeds. Flowering time the rainy season; the seed ripens in October.

Compare with *Gærtner's Aegiceras minus.*

Leaves alternate, unequally pinnate; from six to eight inches long. *Leaflets* five or seven, sub-alternate, short-petiolate, from ovate to oblong, entire, firm, polished, obtusely acuminate, from two to five inches long, and from one to two broad, the exterior by far the largest. *Stipules* ensiform. *Panicles* axillary, several together; slender, smooth, nearly as long as the leaves. *Flowers* numerous, small, sub-campanulate, white and fragrant. *Calyx* five-leaved; *leaflets* broad-ovate, sub-ciliate, permanent. *Petals* five, linear-oblong, margins connected for a little way near the base, above that sub-campanulate. *Filaments* ten, alternately long, broad toward the base, and there united into a ring round the lower half of the germ. *Anthers* oval, incumbent. *Germs* five, each one-celled, and containing a single *ovula*, attached to the bottom of the cell. *Styles* five, scarcely half the length of the stamina, recurvate. *Stigmas* simple. *Capsule* solitary; the four abortive germs may be found under its base, now minute, dry and compressed, obliquely ovate-oblong, coriaceous, smooth, about an inch, or three quarters long, one-celled, one-valved, one-seeded, opening along the whole of the inside, exposing the seed before quite ripe. *Seed* solitary, attached to the bottom of the capsule, as in the germ, ovate, invested in a complete orange-coloured aril. *Perisperm* none. *Embryo* conform to the seed, inverse. *Cotyledons* thick fleshy, of a pale green. *Radicle* patelliform.

II. 455

ROBERGIA. Schreb. gen. n. 787.

Calyx five-parted. *Petals* five. *Drupe* one-celled, with two-valved nut. *Seed* solitary. *Embryo* inverse, and furnished with a perisperm.

R. hirsuta. R.

Shrubby, scandent, hairy. *Leaves* unequally pinnate; *leaflets* from four to eight pair, oblong-cordate, entire. *Panicles* terminal and axillary.

A native of Chittagong, where it blossoms in March.

The cortex of the drupe has its inner lamina perforated with large cells filled with a fragrant, clammy, brownish balsam.

COTYLEDON. Schreb. gen. n. 788.

Calyx four or five-cleft. *Corol* one-petalled, four or five cleft. *Nectary* of four or five awled scales embracing the germs. *Capsules* four or five. *Seeds* numerous.

II. 456

1. C. *laciniata. Willd.* 2. 758.

Perennial. *Leaves* decompound, pinnatifid, and simple. *Flowers* octandrous.

Planta anatis. *Rumph. Amb.* 5. *t.* 95.

Hemasagara. *Asiat. Res.* 4. *p.* 284.

Beng. Hemsagur.

Found in gardens about Calcutta, and in flower during the rainy season.

2. C. *rhizophylla. R.*

Shrubby, succulent. *Leaves* fleshy, simple and pinnate, crenate, viviparous. *Flowers* pendulous, octandrous.

A native of the Moluccas, in the Botanic garden at Calcutta; it blossoms in the cold season. When leaves are placed in a damp place and shaded, young plants spring from their crenatures.

3. C. *heterophylla. R.*

Perennial, succulent, smooth. *Leaves* opposite, petioled; in young plants ternate, when more advanced simple, ovate-oblong, slightly laciniate, fleshy, smooth. *Corymbs* decompound. *Flowers* octandrous.

A native of Mysore, in the Botanic garden at Calcutta; it blossoms during the cool season. Page Carey Ed.

BERGIA. Schreb. gen. n. 791.

Calyx five-parted. *Corol* five-petalled. *Capsule* superior, globular, protuberant, five-celled, five-valved, valvelets petal like. *Seeds* most numerous.

1. B. *verticillata. Willd.* 2. 770.

Creeping, annual. *Leaves* lanceolar, serrate, smooth. *Flowers* axillary, sessile, numerous.

Pola-tsjira. *Rheed. Mal.* 9. *t.* 78.

Teling. Neeroo-pavala.

Hind. and *Beng.* Lal-khesura. II. 457

A native of various parts of India in wet places during the rainy season.

2. B. *ammanioides. Roxb.*

Annual, erect, ramous. *Flowers* axillary crowded with stamina, corresponding in number with the parts of the calyx and corol.

Lechea *verticillata. Willd.* 1. *p.* 495.

A native of various parts of India; it appears and flowers during the rains and cool season.

OXALIS. Schreb. gen. n. 794.

Calyx five-leaved. *Corol* five-parted, cohering above the claws. *Capsule*, superior, five-celled, five-valved, five-cornered, opening at the angles.

1. O. *corniculata. Willd.* 2. 800.

Creeping, ramous, villous. *Leaves* ternate. *Peduncles* longer than the leaves, umbelliferous. *Flowers* monadelphous. *Filaments* alternately shorter and sterile. *Capsule* subcylindric.

2. O. *pusilla. Salisbury in Trans. of Linn. Soc.* 2. 243.

Sans. Amlulonika, Chukrika.

Beng. Amrool.

Common all over India, delighting in cool, dark, shady moist places, where it blossoms most part of the year.

3. O. *sensitiva. Willd.* 2. 804.

Leaves pinnate. *Peduncles* umbelliferous.

Hind. Lak chana.

Todda vaddi. *Rheed. Mal.* 9. *t* 19. is a pretty good representation of a young plant, while Herba sentiens, *Rumph. Amb.* 5. *t.* 104. *f.* 2. is tolerable for an old one.

Common all over India, and in flower the whole year.

CERASTIUM. Schreb. gen. n. 797 II. 458

Calyx five-leaved. *Petals* two-cleft. *Capsule* one-celled, gaping at top.

C. *cordifolium. R.*

Annual, flaccid, ramous. *Leaves* opposite, the lower ones petioled, the superior ones stem-clasping. *Peduncles* solitary, one-flowered, hairy.

A native of Bengal, where it appears as a weed in our gardens and cultivated fields during the cool season.

DECANDRIA DECAGYNIA.

PHYTOLACCA. Schreb. gen. n. 800.

Calyx none. *Petals* calycine. *Berry* superior, ten-celled ten-seeded (or compound,) with a seed in each acinus.

P. acinosa. R.

Herbaceous, erect, ramous. *Leaves* oblong. *Flowers* decandrous. *Berries* composed of from six to eight distinct acini.

A native of Nepal. It flowers about the end of the cool and the beginning of the hot season in the Botanic garden at Calcutta. The leaves are used by the natives of Napal in their diet.

CLASS XI. II. 459

DODECANDRIA MONOGYNIA.

RHIZOPHORA. Schreb. gen. n. 806.

Calyx from four to many-cleft. *Corol* from four to many-petalled. *Stamina* from eight to many. *Germ* inferior, from three to four-celled; cells from one to two-seeded; attachment superior. *Pericarp* none. *Seed* solitary, subcylindric. *Embryo* inverse, no perisperm.

1. R. *mangle. Willd.* 2. 843.

Leaves opposite, oblong, cuspidate. *Peduncles* three-flowered. Flowers octandrous. *Fruit* subulate-clavate.

Page Carey Ed.

Pee-candel. *Rheed. Mal.* 6. *t.* 34.

Teling. Upoo-poma.

Mangium calendarium. *Rumph. Amb.* 3. *t.* 71.

Bhora of the inhabitants of the Delta of the Ganges, where it grows to be a tree of considerable size.

Leaves opposite, petioled, decussate, oblong, entire, cuspidate, smooth on both sides, fleshy, veinless, marked with numerous, blackish minute dots underneath; from four to six inches long. *Petioles* round, about an inch long. *Stipules* large, in pairs within the leaves, caducous. *Peduncles* axillary, solitary, recurved, generally three-flowered, smooth, compressed, bracted at the apex, where it divides. *Pedicles* short, thick and ending in a cup-like bracte, in which the flower sits. *Calyx* four-leaved. *Leaflets* oblong, permanent. *Petals* four, lanceolate, having the inside and margins very woolly. *Filaments* always eight, very short. *Anthers* linear. *Germ* superior, four-celled, each containing a single *ovula* attached to the upper end of the axis. *Style* thick. *Stigma* bidentate. *Seed* clavate, pendulous, from one to two feet long, pretty smooth, its base inserted, (as in a socket,) into a large firm flask-shaped receptacle, which I take to be the albumen and vitellus of Gærtner. If the seed be erect, the permanent calyx adheres to its globular base. *Perisperm* none. *Embryo* inverse. *Cotyledons* undetermined. *Plumula* of a long, sharp, conical shape, two-lobed; plumula within. *Radicle* conform to the seed, superior, the real root proceeds from its apex.

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The great length of the seed of this species, gives in a very short time a young tree; for if the apex from whence the root issues, is only stuck a little way into a wet soil, or mud, the leaves quickly unfold at the opposite end, as mentioned by Brown in his History of Jamaica.

The wood of this tree is of a dark reddish colour, hard and durable.

2. R. *gymnorhiza. Willd.* 2. 813.

Leaves opposite, oblong and broad-lanceolar, smooth. *Flowers* solitary. *Calyx* many-cleft. *Stamens* twenty or more.

Kandel. *Rheed. Mal.* 6. *t.* 31. *and* 31. *good. Rumphius's* figures are not so good.

Kakra of the inhabitants of the Delta of Ganges, where, in such places as the spring tides rise over, it grows in abundance to be a tree of considerable magnitude.

Trunk generally dividing before it reaches the ground, like a parcel of hop-poles piled up in form of a cone. *Leaves* opposite, decussate, crowded about the ends of the branches, petioled, erect, oblong, pointed, very smooth, entire, firm, and somewhat fleshy, almost veinless; generally about six inches long. *Petioles* from one to two inches long, channelled. *Stipules* large, within the leaves, caducous. *Peduncles* axillary, solitary, one-flowered, shorter than the petioles, nodding. *Calyx* about twelve-cleft; *divisions* tapering, acute, a little incurved, fleshy, smooth, permanent. *Petals* just as many as the divisions of the calyx, of nearly the same length, and inserted on its inside, opposite to the fissures thereof; at the base they are formed into a tube opening on the inside, and there bearded; *apex* two-lobed, and ornamented with, generally, five short filaments. *Stamens* just twice as many as there are petals in the corol, two being found enclosed within each of them. *Filaments* half the length of the petals, unequal, the interior one of the pair being shorter. *Anthers* linear, erect, with their apices sharp and incurved. *Germ* inferior, turbinate, three or four-celled, with two *ovula* in each. *Style* the length of the stamens. *Stigma* slightly three or four pointed. *Pericarp* no other than the permanent calyx, in which the *plumula*, or ascending part of the embryo on the base of the seed is lodged. *Seeds* solitary, subcylindric, tapering equally towards each end, pendulous; the *plumula*, or ascending part of the future plant is lodged on the base, while from its apex the *rostellum*, or root issues.

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The wood is of a yellowish colour, hard and durable; its chief use is for burning, and for posts with which to construct the houses of the natives.

3. R. *parviflora. R.*

Leaves ventricose-oblong. *Peduncles* axillary, many-flowered; *calyx* eight-cleft. *Stamina* eight pair, embraced by the eight petals. *Fruit* subcylindric.

A small, very ramous, smooth, glossy tree, a native of the salt, and brackish creeks, &c. of the Delta of the Ganges. Flowering time December. *Leaves* opposite, crowded about the ends of the smooth twigs, short-petioled, from broad-lanceolar to ventricose-oblong, entire, firm and polished; from four to five inches long, and from one to two broad. *Stipules* large, within the leaves, &c. as in the *Fici. Peduncles* axillary, once or twice trichotomous, smooth. *Bractes* small. *Flowers* small, one on each division of the peduncles. *Calyx* eight-cleft; *segments* acute. *Petals* eight, considerably shorter than the segments of the calyx, deeply emarginate, and bearded; sides incurved, round the two stamina. *Filaments* sixteen, unequal, inserted by pairs into the receptacle immediately within the petals, and closely embraced by their incurved sides. *Anthers* sagittate. *Germ* inferior, cylindric, furrowed, three-celled, containing in each two *ovula* attached to the top of the axis. *Style* shorter than the petals. *Stigma* three-toothed.

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TRIUMFETTA. Schreb. gen. n. 819.

Calyx five-leaved. *Corol* five-petalled. *Germ* superior, from three to four-celled; cells one or two-seeded; attachment superior. *Capsule* hispid, three or four-partible. *Embryo* inverse, and furnished with a perisperm.

1. T. *trilocularis. Roxb.*

Shrubby. *Leaves* three-lobed, serrate, from three to five-nerved, downy. *Racemes* terminal; *flowers* complete. *Capsule* three-celled.

A native of India. In the Botanic garden at Calcutta it blossoms during the cool season, viz. November, December, January and February, and the seeds ripen from March to June. Page Carey Ed.

Stem short, stout and ligneous; covered with pretty smooth ash-coloured *bark*. *Branches* numerous. *Young shoots* clothed with stellated pubescence. Height of plants three or four years old, five feet. *Leaves* alternate, petioled, broad-cordate, three-lobed, from three to five-nerved, unequally serrate; both sides clothed with soft pubescence. Those next the racemes ovate-oblong, from one to six inches long. *Stipules* ensiform. *Racemes* terminal. *Peduncles* verticelled, three-flowered. *Bractes* numerous, the large solitary one at each verticel may be called a floral leaf, its lower serrature on each side glandular, the rest ensiform. *Flowers* numerous, small, yellow, pedicelled. *Calyx, color,* and *stamina* as in the genus. *Nectarium,* a slender, crenulate cup round the insertion of the petals. *Germ* round, echinate, three-celled, with two seeds in each, attached to the upper end of the axis. *Style* simple, length of the petals. *Stigma* minute, obscurely three-toothed. *Capsule* globose, of the size of a pea, brown, and of a tough coriaceous texture, armed with numerous, diverging uncinate, backwardly hispid bristles, marked with three small sutures, which do not open, (three-celled.) *Seeds* two in each cell, obliquely ovate, of a brown colour. *Integuments* two, the exterior one thin, the the *inner* one thick and tough. *Perisperm* conform to the seed. *Embryo* straight, inverse, the length of the perisperm, yellowish. *Cotyledons* oval. *Radicle* cylindric, superior. II. 463

2. T. *Bartramia. Willd.* 2. 854.

Annual, erect, ramous. *Leaves* with the anterior part three-lobed, serrate, hairy. *Flowers* axillary.

Beng. Bun-okra.

Lappago Amboinica. *Rumph. Amb.* 6. *p.* 59. *t.* 25. *f.* 2.

A native of various parts of India.

PORTULACA. Schreb. gen. n. 824.

Calyx two-cleft. *Corol* four or five-petalled. *Capsule* circumcised.

1. P. *oleracea. Willd.* 2. 859.

Leaves cuneiform. *Flowers* sessile.

Hind. and *Beng.* Loonya or Nooniya shak.

Arab. Khurfa also Tooruk.

2. P. *meridiana. Willd.* 2. 861.

Annual, creeping, the joints hairy. *Leaves* oblong, fleshy. *Flowers* subsessile, with four floral leaves and a hairy involucre. *Petals* four. *Stamina* from six to eight.

Nela tsjera. *Rheed. Mal.* 10. *t.* 31. which Willdenow quotes for his *Oldenlandia depressa.* Are they the same? II. 464

Teling. Pail-kura.

Beng. Nooniya.

Its flowers open at noon, and shut at two. It is common in gardens, chiefly as a weed, though much used by the natives of Coromandel, as a pot-herb.

3. P. *quadrifida. Willd.* 2. 860.

Creeping; joints hairy. *Leaves* oblong, fleshy. *Flowers* subsessile, with four floral leaves; *petals* four; *stamens* ten or twelve.

Teling. Pedda pail-kura.

It is much like P. *meridiana,* but a much rarer plant, and considerably larger in all its parts, in the form, &c. of its stems, branches, leaves, hairs that surround the joints, and the insertion of the leaves and flowers, four terminal leaves, or bractes, &c. they are nearly alike; but in this species there are from ten to twelve stamens, and always four stigmas, which are the chief marks by which it is distinguished from *meridiana.*

The natives do not eat this sort; they reckon it very unwholesome, and apt to produce stupefaction.

The flowers expand at or before noon, and continue open till near sun-set; this is another circumstance which marks its being a distinct species, and no variety of P. *meridiana.*

4. P. *tuberosa. R.*

Root tuberosus and villous. *Leaves* alternate, lanceolate. *Flowers* terminal.

A native of the Circars. It flowers during the rainy season.

TALINUM. Juss.

Calyx two-leaved. *Corol* five-petalled. *Germ* superior, one-celled, many-seeded; attachment inferior. *Capsule* three-valved, one-celled. *Seeds* several. II. 465

T. *cuneifolium. Willd.* 2. 864.

Leaves obovate, cuneate, smooth, entire, fleshy. *Panicle* terminal, inferior peduncle from two to four-flowered.

Native place uncertain. In the Botanic garden at Calcutta, it flowers chiefly during the rains, and ripens abundance of seed in the cool season.

PEMPHIS. Forst.

Calyx tubular, twelve-toothed. *Petals* six. *Germ* semitrilocular; *ovula* many on a receptacle rising from the bottom of the cell. *Capsule* superior, one-celled, many-seeded.

P. *angustifolia. R.*

Page Carey Ed.

Shrubby, hoary. *Leaves* opposite, sessile, lanceolar.

Found by Colonel Hardwicke, growing on the shores in corol sand between Port Louis and Petit Rivier, on the Mauritius; in flower in August. At a distance, he says, it resembles much a common Myrtle bush.

DODECANDRIA TRIGYNIA.

EUPHORBIA. Schreb. gen. n. 823.

Calyx one-leafed, gibbous. *Corol* four or five-petalled, sitting on the calyx. *Capsule* tricoccous.

1. E. *ligularia. R.*

Arboreous; *branches* five-angled. *Flowers* stipulary.

Leaves petioled, wedge-shaped. *Peduncles* from three to fifteen-flowered.

Ligularia. *Rumph. Amb.* 4. *t.* 40.

II. 466 *Beng.* Munsa-sij.

I have only found this plant in Bengal, about the houses of the natives. Flowering time the months of February and March; when perfectly destitute of foliage, ripe seed not seen.

Root branchy. *Trunk* when twenty years old, round and scabrous, often a foot in diameter, the whole height of the largest trees seldom more than twenty feet. *Branches* scattered, ascending, having the *young shoots* constantly five-sided, *angled,* somewhat spirally disposed and armed with elevations like the teeth of the largest saw; each of these supports a leaf, and a pair of short, sharp, black, hard, stipulary thorns. Like the other species every part abounds with acrid milky juice, which is employed to remove warts, cure cutaneous eruptions, &c.

Leaves alternate, about the summits of the branches, short-petioled, inserted singly on the elevations, or serratures of the angles of the branches, wedge-shaped, entire, waved, fleshy, smooth on both sides, almost veinless from six to twelve inches long, and two or three broad, deciduous at the beginning of the cool season, and appearing again after the flowers decay, in March or April. *Peduncles* solitary in the sinuses between the serratures of the angles of the branchlets, short, once, twice, or thrice dichotomous, with a sessile flower in the forks, that is, bearing three, seven, or fifteen flowers. The sessile flower which is the largest, is often entirely male, the lateral, or terminal peduncled ones have always been found to contain one pistil; II. 467 and male florets. *Flowers* middling sized, greenish yellow. *Bractes* reniform, opposite, embracing the base of the pedicels on the outside, withering. *Calyx** five petalled. *Petals* roundcordate, fringed with a finely ragged margin inserted into the calyx, just under its fissures. *Stamina* collected into five fascicles; *male florets* of about five each, which expand in succession, and are surrounded with an uncertain number of finely divided petals, or scales. *Anthers* four-lobed. *Germ* pedicelled, somewhat two-lobed, three-celled, with one seed in each, attached to the top of the axis. *Style* short. *Stigma* three-cleft.

This plant is sacred to Munsa, the goddess of serpents. The root of the tree mixed up with black pepper, is employed for the cure of their bites; both internally and externally. In the months of July and August, on Tuesdays and Saturdays, the natives approach the tree with offerings, and pray to Munsa to be preserved from the bite of snakes. I suspect this and Euphorbia nereifolia, have hitherto been considered as one species, both being quoted for the last by Linnæus, Burman, &c. I have for these fourteen years had both growing in this garden, so that I do not hesitate to pronounce them totally distinct, and clearly marked.

2. E. *nereifolia. Willd.* 2. 984.

Arboreous. *Branches* round. *Thorns* stipulary. *Leaves* subsessile, wedge-shaped. *Peduncles* three-flowered.

Ela-calli. *Rheed. Mal.* 2. *t.* 43.

II. 468 Tithimalus zeylanicus. *Pluck.* 2. *t.* 330. *f.* 4.

Beng. Sij.

It grows to be a small, poor looking tree, delighting in an almost dry, barren soil. Flowering time the hot season.

3. E. *antiquorum. Willd.* 2. 881.

Shrubby, leafless. *Branches* spreading, triangular, armed with double spines at the protuberances of the angles. *Peduncles* solitary or in pairs; three-flowered.

Sanscrit. Seehoondee.

Beng. Nara-shij.

Teling. Buma chunadoo.

Schadida calli. *Rheed. Mal.* 2. *t.* 42.

Very common on barren uncultivated lands all over India. In Bengal it blossoms during the cold season.

4. E. *arborescens. R.*

Arboreous, leafless. *Branches* numerous, ascending, triangular, armed, as in *antiquorum.*

Native place uncertain, but I believe, Bengal. In the Botanic garden at Calcutta it grows

* The calyx and corol, as hinted by that excellent Botanist Jussieu, in his Genera Plantarum, page 424, may be considered a common perianth, or involucre to many male florets only; or encircling one female. The plants bearing such compound flowers, I have observed to be arboreous or shrubby, with the branches angular, or cornered, and armed with stipulary spines, namely, E. *antiquorum;* and three other East Indian triangular species, one round E. *nereifolia*, five and one-angled *ligularia* of *Rumphius;* and very lately from Pegu, a small, shrubby, tuberous-rooted unarmed species, with similar flowers, has come to my knowledge; a drawing and description thereof accompanies this under the name E. *sessiliflora.*

to be a pretty large tree, with a round distinct trunk, and numerous branches forming a large, dense, subglobular head. Page Carey Ed.

5. E. *lactea. R.*

Shrubby, erect. *Branches* erect, appressed, triangular, armed, leafless.

A native of the Moluccas, differing from *antiquorum* in being more slender, in having the centre of the three sides milky coloured, and particularly in the erect appressed habit of the numerous branches. It has been twelve years in the Botanic garden at Calcutta, but has not yet blossomed.

6. E. *trigona. R.*

Shrubby, three-sided; angles deeply repand with a pair of short spines, and a large sessile obovate cuneate leaf from the apex of each tubercle. *Peduncles* three-flowered. This pretty species of *Euphorbia* was brought from the Molucca Islands to the Botanic garden at Calcutta in 1798, where it thrives well, and blossoms in February, March, and April. II. 469

Stem erect, three-sided, with a few scattered, ascending, smooth, deep green, succulent branches; these are all three-sided, with the angles considerably extended into large, scollop-toothed tubercles; the extremity of each is armed with two short, sharp spines, and like the rest of the family every part abounds with much acrid, milky juice; the general height of the plants, when ten years old, six or seven feet. *Leaves* solitary, one between each pair of spines at the end of the tubercles, sessile, wedge-shaped, entire, smooth on both sides, having the upper side of a deep green, and being much paler underneath, from one to two inches long, and less than half that in breadth. *Stipules*, on the upper side of the base of each spine, is a small, somewhat acute, hard, brown gland, not unlike the spines themselves, but much smaller. *Peduncles* from the sinuses on the angles of the branches, short, thick, generally three-flowered, the main one sessile, containing five fascicles of staminary male florets only; the lateral pedicelled flowers, contain one female and five male florets. *Calyx* in both five-parted; *segments* two-edged, entering the calyx below its fissures, roundish, jagged, incurvate over the male and hermaphrodite flowers, there are five segments of the male florets those are in fascicles of about six each, lengthening and expanding in succession, these are also surrounded by several multifid scales, or petals. *Anthers* of two round lobes. *Germ* superior, short-pedicelled, ovate, three-sided, three-celled, with one seed in each, attached to the top of the axis. *Style* short, half three-cleft. *Stigmas* emarginate. The ripe seed not found. II. 470

7. E. *Tirucalli. Willd.* 2. 890.

Arboreous, unarmed branchlets, cylindric, succulent, polished, from alternate to crowded. *Leaves* linear, sessile. *Flowers* terminal, and in the forks of the branchlets.

Tirucalli. *Rheed. Mal.* 2. *t.* 44.

Ossifraga-lactea. *Rumph. Amb.* 7. *t.* 29.

Beng. Lunka sij.

Tam. Tiru calli.

A native of various parts of India; when well advanced in age and size it flowers during the rains. About Madras it is very generally employed for fences, and there called Milk hedge.

Trunk of old trees as thick as a man's thigh or more. *Bark* dark olive-coloured and cracked. *Wood* white, pretty close grained, and of a middling hardness. *Branches* very numerous; *young shoots* from alternate to crowded into the form of an umbel, proliferous, succulent, smooth, polished, green points abrupt. Every part abounding in an acrid milky, juice. General height of what may be called large trees, twenty feet. *Leaves* alternate, remote, and at the end of the twigs chi fly sessile, linear, smooth, small and fleshy. *Flowers* at the end of the twigs and in the divisions of the branchlets, crowded, subsessile, chiefly female, or abortive hermaphrodite, small, pale yellow. *Calyx* campanulate; *mouth* enlarged by three or four, or more generally five, flat, roundish, smooth, peltate, horizontal segments, on the inside of the bell, woolly. *Corol*, I could find no other than the peltate segments of the calyx. *Stamina* very uncertain, more frequently not found, when present very few, involved in wool. *Anthers* two-lobed. *Germ* pedicelled, woolly, three-celled, with one seed in each attached to the top of the axis. *Style* recurved. *Stigmas* bifid, with enlarged glandular heads. *Capsule* the size of a large pea, villous, hard, dark brown, three-lobed, three-celled, six-valved. *Seed* solitary, ovate. *Integuments* two, the inner one a white membrane adhering to the exterior one. *Perisperm* and *embryo* as in the other *Euphorbiæ*. II. 471

8. E. *dichotoma. R.*

Somewhat shrubby, hairy. *Leaves* opposite, oval, serrate, three-nerved, hairy. *Flowers* in terminal and axillary heads, imbricated with hairy scariose bractes. *Corol* of four large obcordate, membranaceous petals.

Found by Dr. Hunter at Oojjein; it blossoms in October.

9. E. *cuneifolia. R.*

Shrubby, particularly near the root, erect. *Leaves* alternate, sessile, cuneiform, entire, smooth. *Umbel* trifid then bifid. *Involucres* oblong, involucels cordate. *Capsules* smooth.

Found by Colonel Hardwicke in the northern parts of Hindoostan; in flower in March.

10. E. *sessiliflora. R.*

Root tuberous. *Stem* simple, round, smooth. *Leaves* alternate, sessile, oblong, obtuse. *Flowers* axillary, sessile.

This pretty little species was brought from Pegue by the Rev. Mr. Felix Carey to this garden, where it blossoms freely during the month of February, at which time it is perfectly destitute of leaves; like the rest it is abundantly lactescent.

Root an irregularly shaped single tuber, about the size of a potatoe, in our small plants. *Stem* erect, simple, round, smooth, about a foot high. *Leaves* sessile, alternate, oblong, obtuse,

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smooth, entire, nearly veinless; about three inches long and about half as much broad, deciduous in the cold season, and appearing before the rains set in, when the plant has done flowering. *Stipules* a minute glandular point on each side of the insertion of leaves. *Flowers* axillary, sessile, solitary, or paired with the rudiments of one or two more pressing on opposite sides of the fleshy base of the common calyx, and covered by an angular bracte. *Calyx* common, its mouth divided into five equal semilunar coloured segments. *Petals* five, red equal, with the apex incurved and deeply cut into filiform segments. *Stamina* in five fascicles of five each. *Germ* oval. *Style* scarcely any. *Stigma* trifid.

11. E. *acaulis. R.*

Root tuberous, perennial, stemless, unarmed. *Leaves* radical, fleshy, sessile, cuneiform, smooth, with curled margins, crenulate, and callous, with a circular apex. *Peduncles* from the crown of the (now leafless) tuber, three, five, or seven-flowered.

A native of Bengal. From Poornea Mr. B. Smith sent me a plant to the Botanic garden at Calcutta, where it flowers in March, its leafless period, but has not yet produced ripe seeds. The leaves spread much and are deciduous about the end of the rains, and appear after the flowers have perished, in April and May. As in our East Indian armed *Euphorbias*, the flowers are compound, that is several male corollets surround the pistillum.

12. E. *hirta. Willd.* 2 897.

Annual, hairy, oblique, with the apices recurved. *Leaves* opposite, obliquely oblong, serrulate. *Umbellets* axillary, peduncled, globular.

Beng. Bura keru.

Tithymalus botryoides. *Burm. zeyl.* 223. *t.* 104.

A common weed every where, and in flower and seed the whole year.

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13. E. *parviflora. Willd.* 2. 898.

Annual, smooth, dichotomous, oblique. *Leaves* opposite, obliquely-oblong, serrulate, smooth. *Flowers* interfoliaceous, many on a common peduncle, one on a proper peduncle of the same length. *Calyx* and *corol* unilateral, and each of four parts.

A native of various parts of India, and in flower nearly all the year.

14. E. *glauca. Willd.* 2. 916.

Erect, smooth. *Leaves* lanceolate, entire. *Umbel* quinquifid-trifid. *Involucres* linear-oblong, involucells ovate-cordate. Inside of the calyx woolly.

A native of Hindoostan.

15. E. *thymifolia. Willd.* 2. 898.

Branches pressing flat on the earth, coloured, hairy. *Leaves* opposite, obliquely ovate, serrate. *Flowers* axillary, crowded, short-peduncled. *Calyx* and *corol* of four semilateral parts each.

Beng. Swet-kerua.

A native of gravelly spots, and in flower most part of the year.

16. E. *uniflora. R.*

Annual, dichotomous, diffuse, filiform, smooth. *Leaves* somewhat linear, with the base obliquely cordate, and serrulate toward the apex. *Flowers* solitary. *Petals* with a large gland on the inside. *Capsules* smooth.

Common on dry barren spots, such as neglected gravel walks, &c. flowering all the year.

17. E. *chamaesyce. Willd.* 2. 999.

Root perennial. *Branches* spreading flat on the ground, smooth, and sub-dichotomous. *Leaves* opposite, obliquely-oblong, serrulate. *Flowers* axillary, solitary.

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Beng. Chota-kerua.

A native of Coromandel and Bengal, on neglected gravel walks, &c.

18. E. *dracumculoides. Willd.* 2. 905.

Annual, erect, unarmed, ramous above the base. *Umbel* three or four-fid, dichotomous. *Involucres* and involucells linear, sessile, diverging, entire and smooth. *Petals* two-horned.

Beng. Chagul-putputi.

A native of Coromandel and Bengal. It flowers during the cold season. Differs from *exigua*, in being ramous up to the umbel; in having the leaves, involucres, and involucells; linear and spreading horizontally; and in the filaments being nearly cylindric.

19. E. *peltata. R.*

Annual, erect. *Leaves* and *involucres* ovate-lanceolate; *involucells* from oblong to cordate, serrulate. *Petals* peltate. *Capsule* round and smooth.

A native of the interior parts of the Coast of Coromandel; seeds brought from thence to the Company's Botanic garden at Calcutta, grew and have continued sowing themselves, and producing plants every cold season without care.

Stem annual, erect, ramous, round, smooth; the height of the whole plant a foot. *Branches* curved upwards. *Leaves* alternate, sessile, wedge-shaped, and lanceolate, finely serrate, very smooth. *Umbels* terminal, in six rays; the *partial* ones from four to two-cleft. *Involucres* like the leaves, only a little broader. *Involucells* from oblong to cordate, the nearer the apex the broader, all are smooth, and finely serrate. *Flowers* solitary, sessile, small, of a greenish yellow. *Petals* peltate. *Capsules* round, scarcely any angle to be seen, smooth in every part.

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CLASS XII.

ICOSANDRIA MONOGYNIA.

CACTUS. Schreb. gen. n. 838.

Calyx one-leaved, imbricated. *Corol* many petalled. *Berry* inferior, one-celled, many-seeded.

1. C. *indicus. R.* Page Carey Ed.

Joints proliferous, oblong, much compressed, thorns generally simple, long and straight, issuing from tufts of sharp bristles. *Corol* yellow, twice as long as the stamens; *exterior petal* obcordate.

Tam. Naga-kalee.

Beng. Nag-phunee.

This plant is found here and there on road sides, in forests, and among bushes in the vicinity of Calcutta, and I am informed that it is equally common, not only over the whole of the province, but also on most of the adjoining districts; so that, independent of its proper Bengalee name, and medicinal uses, there is every reason to imagine it is a native of these countries. Nor can I well reconcile it to any of the *opuntias* hitherto described; as will appear more evidently after reading the following description. It is in flower during the hot season, and more or less the whole year round.

Root fibrous. *Trunk*, I have not yet seen any plant with any thing like one, (though I am informed it grows to be a perfect tree,) here it is a ramous bush, with tolerably erect joints; these are proliferous, of an obovate-oblong form, and much compressed, thin, while young smooth, except in the axills of the leaves;* length and breadth various, according to soil and situation. *Leaves* scattered over the joints, small, sessile, subconical, fleshy, caducous. *Thorns* axillary, generally single, though sometimes in pairs, straight, from half an inch to two inches long, very strong, whitish, except the point, which is darker coloured, and very sharp; their insertions are surrounded with innumerable, slender, sharp, short bristles, which readily penetrate the skin, and give much trouble to the unwary handler. *Flowers* from the upper edges of the joints; sessile, large, of a bright beautiful yellow colour, opening only in the day. *Calyx* one-leafed, consisting of a leathery cup which fills exactly the umbilicus of the germ, deciduous with the corol, stamens and style in one body. *Petals* many, the exterior ones smaller, and obcordate; the interior ones oblong with somewhat ragged margins. *Stamens* not half the length of the petals. *Pistillum*, &c. as in the genus. II. 476

Upon this plant the Cochineal insects lately brought from America, thrive and multiply abundantly.

2. C. *chinensis. R.*

Subarboreous, joints compressed, proliferous, sublanceolar, almost unarmed. *Petals* retuse, truncate, longer than the stamina.

A native of China; from thence it was introduced into the Botanic garden at Calcutta about twenty years ago, during all that time it has blossomed only once.

FABRICIA.

Calyx five-cleft. *Petals* five, sessile. *Stigma* capitate. *Capsule* many-celled; *seeds* winged.

F. *bracteata. R.* II. 477

Leaves opposite, oblong, the floral ones minute and lanceolate. *Flowers*, solitary, with two bractes below the calyx.

A native of the Moluccas. It has the habit of a *Myrtus*, but from the *capsule* which is from eight to ten-celled, I conclude it is not of that family. The stamina are very numerous, the length of the oval petal. The stigma is truncate, not capitate. The floral leaves are so small, and the flowers so numerous toward the end of the branchlets, as to appear like a panicle

METROSIDEROS. Schreb. gen. n. 791.

Calyx four or five-cleft, semisupera. *Petals* four or five. *Stamina* very long, standing out. *Stigma* simple. *Capsule* three or four-celled.

1. M. *vera. R.*

Leaves opposite, short-petioled, oblong, polished. *Corymbs* axillary, brachiate, shorter than the leaves. *Calyx* four-toothed.

Metrosideros vera. *Rumph. Amb.* 3. *t.* 7.

Rumphius describes it to be a tree of great size, growing in the forests of Amboyna, and the other Molucca Islands. It was introduced from the former place into the Botanic garden at Calcutta in 1801, and in July 1804, the largest plants blossomed for the first time, when only about seven feet high. It has a slender trunk, smooth bark, and few branches. No part of the tree, so far as I have yet observed, possesses any kind of fragrance.

Leaves opposite, short-petioled, oblong, firm, smooth, polished, perfectly entire, rather acute, with small and parallel *veins*, about six inches long, and from two to three broad. *Corymbs* axillary, solitary, shorter than the leaves, brachiate, bearing a few pretty large, pale greenish white inodorous flowers; pedicels flattened. *Bractes* oblong, or lanceolate, smooth, acute. *Calyx* saucer-shaped, four, rarely five-toothed. *Petals* four, seldom five, sessile, round, expanding. *Filaments* from twenty to twenty-five, much longer than the petals of the same greenish yellow colour, and inserted with them into a rim round the inside of the calyx, at some distance from the four-lobed germ. *Anthers* ovate. *Germ* half above the bottom of the calyx; this part is evidently four-lobed, and a section the roof exposes four distinct cells, with numerous *ovula* in each, inserted on a projecting receptacle, which is longitudinally attached to the axis. *Style* rather longer than the stamens. *Stigma* simple, rather acute, with a perforated the very point. *Capsule* nearly globular, the size of a pea, two thirds above the calyx, II. 478

* I call the little caducous conical bodies over the joints leaves

Page Carey Ed. four-celled, four-valved. *Seeds* numerous, angular.

2. M. *comosa. R.*

Leaves alternate, sessile, narrow-lanceolate, attenuated to both ends, mucronate, smooth, rigid, with the margins entire and thickened. *Flowers* lateral, crowded into a cylindrical trifid spike. *Calycine* segments semicircular and smooth, as are also the round subsessile petals. *Stigma* concave.

A native of the Moluccas.

3. M. *suberosa. R.*

Bark of even the young shoots cracked and corky. *Leaves* opposite, sessile, lanceolate, smooth. *Umbellets* lateral.

A native of the Moluccas.

Branchlets covered with deeply cracked corky bark. *Leaves* opposite, subsessile, broad-lanceolate, entire, taper, obtuse-pointed, firm and polished on both sides, from six to seven
II. inches long and two broad. *Umbellets* from the old axills below the leaves, sessile. *Pedicels*
479 clavate, smooth, one-flowered, which with the germ and calyx form a perfect imitation of a speaking trumpet. *Calyx* narrow-campanulate, obscurely four or five-toothed. *Petals* four or five, round, small, sessile. *Filaments* numerous, much larger than the petals. *Germ* three-celled. I have not found the ripe nor even full grown seed vessel. *Style* rather shorter than the filaments. *Stigma* acute.

4. M. *linearis. Smith. in Trans. Linn. Soc.* 3. *p.* 271.

Shrubby. *Leaves* scattered, linear, channelled, acute, rigid. *Flowers* crowded round the branchlets, a little below their trifid apices, some of them axillary.

This beautiful plant was reared in the Botanic garden at Calcutta, from seed sent by Colonel Patterson from New South Wales in 1800. In seven years the plants were six or eight feet high, stout and rigid. Flowering time in Bengal, April and May ; the seeds require above a year to ripen.

Stem nearly erect, about as thick as a man's wrist. *Bark* dark-coloured, and rather scabrous. *Branches* few, scattered, stiff and straight; the ligneous parts ash-coloured, the tender ones downy. *Leaves* scattered, sessile, linear, rigid, channelled, from two to three inches long, and an eighth of an inch in breadth. *Flowers* crowded round the branchlets below the leaves of the same year, sessile, some of them are axillary, and in that case solitary. *Calyx* urceolate ; *margin* five-cleft ; *segments* reniform, deciduous. *Petals* five, greenish, nearly round, villous. *Filaments* inserted on a rim, (within the petals) round the mouth of the calyx, many times longer than the petals, of a bright crimson, and from their number, size, and length, giving that colour to the whole flower, though the petals and calyx are green. *Germ* more than semisupera, being attached to the bottom of the calyx only, round, hairy, generally three-
II. celled, though I have found some with four, each containing numerous, very minute seeds
480 attached to a large convex receptacle in the inner angle of the cell, which is attached to the axis. *Style* as long as the stamina. *Stigma* simple. *Capsule* crowded round the branchlet, seminifera, inserted in the globular, firm, thick calyx, round, of the size of a grain of black pepper, hairy, particularly the vertex, thin, three-celled, three-valved. *Receptacles* as in the germ. *Seeds* numerous, filiform, brown.

Gærtner's figure of *Metrosideros armillaris vol.* 1. 6. 34. *f.* 5. is so exactly like this, that it may well serve to be quoted for it.

PSIDIUM. Schreb. gen. n. 841.

Calyx five-cleft. *Corol* five-petioled. *Germ* inferior, four-celled. *Berry* one-celled, many-seeded.

1. *P. pyriferum. Willd.* 2, 957.

Fruit turbinate.

Eng. White Guava ; however the colour of the inside of the fruit varies much.

Pela. *Rheed. Mal.* 3. *t.* 34.

Hind. Soopari-am, pronounced Sufriam.

Beng. Peyara.

2. P. *pomiferum. Willd.* 2. 958.

Fruit spherical.

Eng. Red Guava, but like the other, the colour of the inside varies much.

Malacka-pela. *Rheed. Mal.* 3. *t.* 35.

Hind. Lal-sufriam.

These two kinds of Guava are very generally cultivated in the warmer parts of America.

CARRALLIA. R.

II. *Calyx* six or seven cleft. *Corol* six or seven-petioled, unguiculate. *Stigma* plate-lobate.
481 *Germ* inferior, one-celled, one-seeded, attachment superior. *Berry* one or two-seeded.

1. C. *lucida. R. Ind. pl.* 3. *n.* 211.

Leaves opposite, oblong, serrulate. *Peduncles* many-flowered.

Teling. Karalli.

This is a small handsome tree, a native of the lower region of the Circar mountains, and of Chittagong. Flowering time March. Leaves not deciduous.

Leaves opposite, short-petioled, oval-pointed, delicately serrate, smooth and shining on both sides; four or five inches long and from two to two and a half broad. *Stipules* interfolia-

ceous, pointed. *Umbellets* axillary, small, rigid, few-flowered, generally three-cleft. *Calyx* above, six or seven parted; *divisions* acute, erect, permanent. *Corol* six or seven-petalled, orbicular, scolloped, waved, inserted into the divisions of the calyx by short claws. *Filaments* twelve or fourteen, of the length of the corol, inserted into the calyx. *Anthers* oblong, erect. *Germ* inferior, globular, one-celled, containing one, two, or three seeds, attached to the top of the cell. *Style* the length of the filaments. *Stigma* three-lobed. *Berry* globular, smooth, pulpy, of the size of a large pea, one-celled. *Seed* one, rarely two, uniform. Page Carey Ed

2. C. *lanceœfolia. R.*

Leaves lanceolar, acutely-serrulate, waved, shining. *Peduncles* many-flowered.

Engeet-darray is the Malay name on the West coast of Sumatra, where the tree is indigenous; from thence it was introduced into the Botanic garden at Calcutta, where in ten years it has attained the height of twenty-five feet, with a very straight *trunk* as in the firs; decorated with numerous, expanding, opposite *branches* and *branchlets*. Bark of the old ligneous parts, smooth and brown, of the tender shoots smooth and green. II. 482

It is a very perfect ever green, and the foliage uncommonly dark.

Leaves opposite, short-petioled, lanceolar, sharply serrulate at the margin, having the upper surface of a clear, shining deep green, and the under one paler, with the apex rather obtuse, from three to six inches long, and from one to two broad. *Stipules* large, linear, sheathing, caducous. *Peduncles* axillary, or where the last year's leaves grew, opposite, rigid, thick and short, generally twice bifid with about three or four sessile, small greenish white flowers on the apex of each division. *Bractes* small, subannular. *Calyx* superior, from six to seven-toothed; *segments* triangular and acute. *Petals* six or seven, inserted by short claws into the calyx immediately under its fissures, sub-reniform, with the margins much curled, and laterally incurved, embracing the middle part of the larger filaments. *Filaments* from twelve to fourteen, inserted into the calyx, alternately shorter, and incurved. *Anthers* incumbent. *Germ* sub-inferior, with a large turbinate crown rising in the centre like the true germ itself, as if the calyx were inferior, this crown is embraced by a yellow crenate ring, which may be called a *nectary;* the germ is five-celled with two *ovula* in each cell attached to the middle of the axis. *Style* nearly as long as the corol. *Stigma* peltate, five-lobed.

EUGENIA. Schreb. gen. n. 842.

Calyx entire, or four-parted. *Corol* four-petalled. *Germ* inferior, two-celled; cells many-seeded; attachment interior. *Berry* one or more seeded. *Embryo* without perisperm. II. 483

1. E. *malaccensis. Willd.* 2. 959.

Trunk straight. *Leaves* from oblong to lanceolar. *Flowers* in sessile, lateral fascicles. *Berries* turbinate.

Jambosa domestica. *Rumph. Amb.* 1. *t.* 37.

Nati-schambu. *Rheed. Mal.* 1. *t.* 18.

Beng. Malacca Jamrool.

A native of the Malay Islands, &c. In Bengal it blossoms and bears fruit at different periods of the year.

There is a variety with dark blood red fruit, which is probably *Rumphius's Jambosa nigra,* 1. *p.* 125. *t.* 38. *f.* 1.

The fruit is large, juicy and beautiful and very generally eaten, though rather insipid.

2. E. *purpurea. R.*

Trunk straight. *Leaves* smooth. *Flowers* in lateral sessile fascicles as in the last. *Berries* oval.

It differs from E. *Malaccensis* in the shape of the fruit only, a native of the Malay Islands, flowering in the hot season; the fruit is as large as that of the former species; the colour a very dark purple.

3. E. *amplexicaulis. R.*

Leaves stem-clasping, oblong, obtuse; *peduncles* lateral, three or nine-flowered. *Berries* spherical.

A stately tree, a native of Chittagong, a country still abounding in numerous undetermined new species of this noble genus. In the Botanic garden at Calcutta it is in flower and fruit at different periods through the year.

Trunk tolerably straight, quickly dividing into numerous spreading branches, forming a large extensive, dense head. *Bark* of the old woody parts brown, but pretty smooth; that of the *young shoots* polished, of a clear green. *Leaves* opposite, stem-clasping, oblong, entire; with a rounded apex, firm and glossy, from six to eight inches long, and from three to four broad. *Peduncles* lateral, short, three-flowered, trifid; each division three-flowered. *Flowers* large, white, inodorous. *Calyx* four-parted; the opposite segments unequal. *Petals* four, nearly round. *Stamina* numerous, &c. as in the genus. *Germ* turbinate, two-celled, with several *ovula* attached to the thickened middle of the partition. *Style* about as long as the stamina. *Stigma* acute. *Berry* round, the size of a small apple, greenish yellow when ripe. *Pulp* of a soft, rather spongy texture, and sweet insipid taste, rarely more than one-celled, containing one or two large, oval, more or less compressed seeds, covered with a soft white integument, the abortive cell, and its contents are very evident in the ripe fruit of this species. *Perisperm* none. *Embryo* erect in the seed. *Cotyledons* of a thick, firm, fleshy texture, and nearly equal. *Radicle* generally near the middle of the cotyledons. II. 484

The cultivation of this species cannot well be recommended, on account of its fruit; but the tree is one of the most handsome of the genus.

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4. E. *Jambolana. Lamarck. Encycl.* 3. 150.

Leaves oblong, entire, sub-acuminate. *Panicles* below the leaves. *Calyx* entire. *Berry* oblong, and often obliquely so.

Calyptranthes *Jambolana. Linn. sp. pl. ed. Willd.* 2. 975.

Perin-njara. *Rheed.* 5. *t.* 29.

Jumboo, Jumboo, Sanscrit names.

Beng. Kalla-jam.

Teling. Nasedoo.

This grows to be a large tree, is common every where, both in its wild and cultivated states; every soil and situation suiting it equally well. Flowering time the beginning of the
II. hot season. The fruit ripens in July and August.
485 *Trunk* generally a little crooked. *Bark* whitish with a few cracks. *Branches* the larger irregular, the smaller depending; the whole forming a very large, beautiful, shady head. *Leaves* opposite, short-petioled, oblong, pointed, waved, smooth, shining, firm, from four to five inches long, and two broad. *Stipules* none. *Panicles* often opposite on the naked *branchlets,* just below the leaves, middle-sized, globular, cross-armed, rigid, and sub-divided by them. *Calyx* cup-form, with the *margin* entire, permanent. *Petals* four, orbicular, claws very short, inserted into the mouth of the corol. *Anthers* small. *Germ* inferior. *Style* rather shorter than the stamens, declining. *Stigma* acute. *Berry* roundish, about the size of a large cherry, succulent, smooth, when ripe black. *Seed* one, roundish, smooth.

The wood of this tree is hard, close grained, and durable; it is of course used for various purposes.

The bark is strongly astringent, and dyes excellent durable browns of various shades according to the corrosive employed, or the strength of the decoction.

The fruits are universally eaten when ripe, by man and birds; they are of a subacid, astringent taste.

There is a variety of the fruit in the northern and mountainous parts of the coast of a superior quality, and as large as a pigeon's egg.

5. C. *obtusifolia. R.*

Leaves elliptic, obtuse, polished; *panicles* below the leaves. *Corol* calyptrate. *Berry* oblong, one-seeded.

Jambolifera *pedunculata. Gært. sem.* 1. 178. *t.* 36.

Jambolana. *Rumph. Amb.* 1. *t.* 42

A tree of considerable size, a native of the Moluccas. In the Botanic garden at Cal-
II. cutta, where it has been about twelve years, it blossoms in March, and the fruit ripens in
486 June. It differs from E. *Jambolana* of the continent of India, only in the leaves being obtuse, and frequently emarginate, as in Rumphius's figure.

Jambosa Ceramica. Rumph. Amb. 1. *t.* 41. seems a species still undescribed, except by Rumphius, which I have not yet met with.

6. E. *operculata. R.*

Trunk short, thin of branches. *Leaves* short-petioled, oblong, smooth, coarsely veined. *Panicles* lateral, brachiate, collecting the flowers in sessile, terminal heads. *Calyx* entire; corol operculate. *Berries* spherical.

From Amboyna this tree was brought to the Botanic garden at Calcutta, where it blossoms in March and April, and the seeds ripen in May and June.

7. E. *caryophylifolia. Lamarck.*

Leaves oblong-lanceolate. *Panicles* below the leaves, cross-armed. *Calyx* obtusely four-toothed. *Corol* four-petioled, deciduous without expanding. *Berry* globular.

Calyptranthes *Caryophyllifolia, Linn. sp. pl. ed. Willd.* 2. 975.

Myrtus *Caminum. Linn. sp. pl.* 674.

Jambosa *Ceramica. Rumph. Amb.* 1. *t.* 41.

Beng. Chota Jamb.

A native of various parts of India, growing luxuriantly in almost every soil, and situation. Flowering time the hot season.

Trunk seldom straight, nor long, but thick, and covered, as well as the numerous spreading branches, with smooth ash-coloured *bark,* the smaller branches, and twigs are generally pendulous. *Leaves* opposite, petioled, nodding, oblong-lanceolate, waved, very smooth, and shining on both sides, with numerous, most slender, paralleled veins; from
II. three to four inches long, and about two broad. *Petioles* about an inch long, channelled.
487 *Panicles* diverging from the naked branchlets below the leaves, cross-armed, rigid. *Flowers* numerous, small. *Calyx* cup-shaped, obscurely four-toothed. *Corol, petals* four or five, orbicular, concave, sessile, they seldom or never expand, but are pushed off by the stamens in one cup-shaped body like the calyptra in mosses. *Stamens* numerous. *Berry* round, but in general disfigured, by depressions or pits, size of a large pea, when ripe black.

Observation. This tree comes exceedingly near my *Eugenia Jambolana,* but when found growing together, it is evidently different. I considered them as one, or at most as varieties of one species, until I met with them both together in this garden, and, have now raised plants from the seeds of each, and they continue distinct. The best distinguishing marks are stated in the definition; besides, the *leaves* and *fruit* of *Jambolana* are much larger in the same soil; particularly the *fruit,* and also uniformly of an oblong shape.

Perin Njara. Rheed. Mal. vol. 5. *t.* 29. is evidently the last mentioned.

The wood is whitish, very strong, close grained, hard and durable. The fruit scarcely eatable, whereas many reckon that of *Jambolana* good, particularly if soaked in a little salt

and water for about an hour, which removes a great part of their superabundant astringency. Page Carey Ed.

8. E. *fruticosa. R.*

Shrubby. *Leaves* from broad-oblong to oval, finely veined. *Panicles* lateral. *Flowers* numerous. *Calyx* entire. *Peduncles* and *pedicells* square. *Corol* four-petioled, but generally deciduous, in form of a lid.

Hind. and *Beng.* Bun-Jamb.

A large shrub or small tree, a native of Chittagong. It flowers during the hot season, and its very small one-seeded berries ripen early in the rainy season. II. 488

9. E. *brachiate. R.*

Arboreous. *Leaves* elliptic, obtuse-pointed. *Panicles* lateral. *Peduncles* and *pedicells* four-seeded. *Calyx* entire. *Berries* spherical.

A native of Amboyna. In the Botanic garden at Calcutta it blossoms in May, and the fruit ripens in July; they are about the size of pease, dark purple or black, and of an astringent taste. It is nearly allied to *fruticosa,* but grows to a much greater size; the leaves are broader and more obtuse, and in the same garden it has taken eleven years from the seed to blossom, while fruticosa requires only three or four.

10. E. *claviflora. R.*

Leaves lanceolar. *Corymbs* lateral, subsessile, umbelliform; *flowers* clavate. *Berries* long, ovate, crowned with the cyathiform base of the calyx.

Lumba-*nuli*-jamb the vernacular name in Chittagong, where it is indigenous, and grows to be a stout useful timber tree, of very considerable size. Flowering time February and March, and the fruit which is eaten by the natives, ripens in May.

11. E. *cerasoides. R.*

Leaves short-petioled, from oval to oblong, remotely coarse-veined. *Panicles* lateral, brachiate. *Fruit* round, of the size and appearance of small black cherries.

Botee Jam, the vernacular name in Chittagong, where it is indigenous. Its trunk is so large as to furnish planks for various purposes. Flowering time April and May, and the fruit, which is very generally eaten, ripens in July.

12. E. *præcox. R.*

Leaves opposite, petioled, lanceolar, rather obtuse, coarsely veined. *Panicles* lateral and axillary, brachiate half the length of the leaves. II.

A stout tree, a native of the hilly parts of the province of Chittagong, where it blossoms 489 so early as January.

13. E. *Paniala. R.*

Leaves broad-lanceolar, acuminate, coarsely veined. *Panicles* lateral, brachiate, flowers in little heads. *Berries* oval.

Beng. Pani*a*la-jamb.

It is one of the largest and most robust trees of this very noble genus; a native of the forests of Chittagong, where they abound more than in any other country I am acquainted with, and furnish the natives with timber of a large size, fit for a variety of purposes. Flowering time the month of April, the fruit ripening in June; they are about the size of a small gooseberry and very juicy.

14. E. *laurifolia. R.*

Leaves subsessile, oblong, glossy, obtusely acuminate. *Peduncles* lateral, three-flowered; *pedicells* clavate, length of the peduncles. *Berries* oblong.

A beautiful, densely ramous, small tree, flowering in the hot season and ripening its fruit during the rains, like many of the other uncultivated species, the pulp of the fruit is in small quantity, and scarce eatable; the shape however of the berries in this species, together with its dark brown bark, immediately point it out.

14. E. *ternifolia. R.*

Leaves tern, sessile, oblong. *Flowers* lateral.

A large tree, a native of Chittagong, where it blossoms in April, and the fruit ripens in June and July: it is eaten by the natives.

Of this beautiful, stately species, there are two varieties, one with white flowers, called by II. the people where the tree grows Phool jamb, the other with lovely rosy flowers they call Lal- 490 phool-jamb. Their leaves are amongst the largest of the genus being from six to fifteen inches long, and from three to six broad.

15. E. *angustifolia. R.*

Leaves tern, linear-lanceolar. *Peduncles* lateral, from three to four-flowered. *Corol* many petalled.

A small tree, a native of Chittagong, where it flowers in March and April. The fruit ripens in June and July.

It is readily known by its many-petalled corol, having from twelve to sixteen petals, and by its three-fold leaves.

16. E. *Zeylanica. Willd.* 2. 963.

Arboreous. *Leaves* short-petioled, oblong, obtusely acuminate, lucid, veinless, when young villous. *Peduncles* axillary, generally solitary, or crowded on little comose racemes.

A native of the Silhet District, where it is called *Nagasun Jamb,* and grows to be a tree of a middling size, flowering in April.

17. E. *myrtifolia. R.*

Shrubby. *Leaves* lanceolate, taper, obtusely pointed, lucid. *Peduncles* axillary, compound, many-flowered. *Berries* spherical.

A beautiful small tree or large shrub, a native of Sumatra, from whence it was sent by

Page Carey Ed. Dr. C. Campbell to the Botanic garden at Calcutta, where in nine years the plants from seed had attained the height of six or seven feet, when they began to blossom in March and April, and the seed ripened in May and June.

18. E. *bracteata. R.*

Shrubby. *Leaves* oblong, ventricose, obtuse, lucid. *Peduncles* axillary, one, rarely two or
II. three, one flowered. *Involucre* two-leaved. *Berries* spherical, smooth.
491 Myrtus *Coromandeliana. Kön. Mss.*

Myrtus *bracteata. Willd.* 2. 969.

Teling. Gorag-moodee.

Hind. and *Beng.* Hijulee Mendee.

It grows in great abundance on the sand hills near to the sea on the coast of Coromandel.

19. E. *polygama. R.*

Polygamous. *Leaves* short-petioled, elliptic, cuspidate. *Panicles* axillary on some trees, and not on others, villous. *Stigma* capitate.

A native of the Malay Archipelago. I have not seen the pericarp, its genus is therefore uncertain, particularly as it has a capitate stigma.

20. E. *venusta. R.*

Arboreous, with numerous drooping branchlets. *Leaves* broad-lanceolar, obtusely acuminate. *Panicles* axillary and terminal, brachiate, shorter than the leaves, ultimate divisions three-flowered

From Tippera, where this elegant tree is indigenous, the seeds were received into this garden, where in six years the largest of the young trees was about twelve feet high, clothed with innumerable slender, drooping branches down to the ground. *Bark* of the woody parts dark brown and smooth, of the tender shoots green and smooth. *Leaves* opposite, short petioled, from lanceolar to oblong; when the plants were younger they were much narrower in proportion to their length, entire, firm, highly polished, obtusely acuminate; from three to four inches long, and one and a half broad. *Panicles* axillary, more rarely terminal, shorter than the leaves, composed of brachiate pairs of branches with their ultimate divisions three-flowered,
II. all round and smooth. *Flowers* like those of the common myrtle, and about the same size.
492 *Calyx* four-toothed. *Corol* of four short-clawed, orbicular, concave, reddish petals. *Germ* two-celled, with many *ovula* in each, &c.

21. E. *acuminata. R.*

Leaves broad lanceolar, acuminate, polished, finely veined. *Peduncles* axillary, terminal, many-flowered. *Corol* operculate. *Berries* round.

A small, but tall, handsome tree, a native of the Moluccas; in the Botanic garden at Calcutta it flowers in March, and the fruit ripens in June.

22. E. *cymosa. R.*

Arboreous. *Leaves* oblong, polished, hard. *Cymes* terminal and axillary, crowded.

Buttee Jamb, the vernacular name in Silhet where the tree is indigenous; it grows to a great size, and the wood is used for various economical purposes. Flowering time December.

23. E. *aquea. R.*

Arboreous, trunk soon divided. *Leaves* opposite, sub-sessile, oblong-lanceolate, entire. *Peduncles* terminal, and from the exterior axills, many-flowered. *Fruit* flattened at both ends, (turnip-shaped.)

Jambosa *aquea. Rumph. Amb.* 1. *p.* 126. *t.* 38. *f.* 2. the rose-coloured variety, and Jambo-ayer. *Rumph. Amb.* 1. *p.* 126. the white.

Both the above varieties have been introduced from the Moluccas into the Botanic garden at Calcutta, where they thrive luxuriantly, and blossom during the month of March, the fruit ripens in May and June.

Trunk short; *branches* numerous down to the ground. *Bark* smooth, ash-coloured; whole
II. height from twenty to twenty-five feet. *Leaves* opposite, very short-petioled, sublanceolate,
493 with their narrow base somewhat cordate; *margins* entire, smooth on both sides. *Peduncles* terminal, and from three to five or seven large, white flowers, on pedicels of various length. *Calyx* the four segments of the border subreniform. *Petals* subrotund, rather larger than the divisions of the calyx. *Filaments* numerous, twice the length of the petals. *Anthers* small, oblong. *Germ* broad-turbinate, two-celled, with the rudiments of many seeds in each. *Style* longer than the stamina. *Stigma* acute. *Fruit* about the size of a large *Medlar*, somewhat turbinate, with both ends much flattened; surface smooth and polished, but uneven, and in the first noticed variety of a most beautiful lively pale rose colour, and aromatic taste, containing from one to four seeds, though in the germ, as in all the other species I have examined there are the rudiments of a great many. The other variety, *Jambo ayer*, has the fruit perfectly white, there is no other difference.

The tree which bears the rose, or pink coloured variety, is conspicuously beautiful, when the drooping branches of the full grown, brilliant coloured fruit, appear through the dark deep green leaves.

24. E. *alba. R.*

Trunk rarely straight, and soon divided. *Leaves* subsessile, oblong. *Peduncles* lateral and terminal, brachiate, many flowered. *Flowers* pedicelled. *Berries* depressed, turbinate.

Beng. Jamrool.

A native of the Malay Islands. In the Botanic garden at Calcutta, this rather low, very ramous tree blossoms, and bears immense crops of large pure white shining fruit during the hot and rainy seasons, but they are very insipid, and quite watery.

25. E. *oblata. R.*

Leaves opposite, broad lanceolar, obtusely-acuminate. *Panicles* terminal, with smaller axillary corymbiform fascicles in the axills, all shorter than the leaves. *Berries* transversely oval. II. 494

Goolam, the vernacular name in Chittagong, where it is found wild, as well as cultivated for its edible fruit; the wood is also in some estimation. It blossoms in March, and the fruit ripens in June and July.

26. E. *lanceæfolia. R.*

Leaves short-petioled, lanceolate, with the base rounded, acuminate, smooth. *Panicles* axillary and terminal, globular, shorter than the leaves. *Berries* oblong, crowned with the entire calyx.

Poora-Jamb, the vernacular name in Silhet, where it is indigenous in the forests of that district, and grows to be one of the largest trees. Flowering time November, and the seed ripens in February; uncommon periods for an *Eugenia* to flower and ripen its fruit; this I am inclined to consider one of the most elegant and most useful species of this extensive, and truly superb genus.

27. E. *lanceolaria. R.*

Leaves short-petioled, narrow-lanceolar. *Flowers* terminal, about fifteen, corymbose-fascicled. *Berries* irregularly round lobate.

Pounee-Jamb, the vernacular name in Silhet, where it grows to be a small smooth tree of from ten to twelve feet in height, the flowers very large, rosy, and somewhat fragrant, which with the elegant foliage, renders it one of the prettiest of this very grand family. It flowers in May, the fruit ripens in December, and though as large as a small apple, is not eaten, the pulp being in small quantity and tough.

28. E. *Jambos. Willd.* 2. 959.

Trunk rarely straight and soon dividing. *Leaves* lanceolate. *Flowers* terminal. *Berries* globular. II. 495

Malacca schambu. *Rheed. Mal.* 1. *t.* 17.

Jambosa sylvestris alba. *Rumph. Amb.* 1. *t* 39.

Jamba the Sanscrit name. *Asiat. Res.* 1. 419.

Beng. Gulab-jamb.

Found common in gardens in most parts of India and its Islands.

29. E. *caryophyllata. Willd.* 2. 965.

Leaves from lanceolar to oblong, acute. *Corymbs* terminal. *Berries* oblong, one, rarely, two-seeded.

Luvunga, the Sanscrit name.

Pers. Meykuk.

English. Clove tree.

On the Molucca Islands where these trees are indigenous they begin to blossom when about nine years old; the average produce is about two, or two and a half pounds of cloves yearly.

Arab. Kerunpul.

Beng. Lung.

Caryophyllus *aromaticus. sp. pl.* 735. *Gært. sem. t.* 167. 33.

Caryophyllus. *Rumph. Amb.* 2. *t.* 1. 2. 3.

30. E. *leptosperuma. R.*

Leaves short petioled, lanceolate, coriaceous, polished. *Panicles* terminal, very ramous. *Calyx* acetabuliform, obscurely five-toothed. *Stigma* two-toothed.

A native of the Island of Romoa.

31. E. *Thumra. R.*

Leaves lanceolar, polished. *Panicles* terminal, extreme, remote, many-flowered. Divisions of the calyx subrotund; *petals* reniform, sessile.

Sent from Pegue by the Rev. Mr. F. Carey, under the vernacular name *Thumra.* II. 496

32. E. *pulchella. R.*

Leaves broad-lanceolar, acuminate, finely veined, lucid. *Panicles* terminal, divided in a triternate form; *peduncles* and *pedicells* four-seeded. *Berries* spherical.

A very beautiful, slow growing, small tree; a native of the Molucca Islands. Flowering time in the Botanic garden of Calcutta March and April, and the fruit which is like the black currant, ripens in the early part of the rains.

33. E. *Inophylla. R.*

Trunk straight to the top of the tree. *Leaves* from oval to oblong, finely-veined and polished. *Panicles* terminal, corymbiform. *Calyx* obscurely from four to five-lobed. *Corol* from four to five-petalled. *Berries* turbinate.

A native of the Moluccas. It flowers during the hot season in the Botanic garden at Calcutta.

Although it resembles the clove tree, it possesses no kind of fragrance. The large pear-shaped berries are not eatable, the pulpy part or rather cortex being of a hard tough texture and unpleasant taste.

34. E. *rubens. R.*

Leaves short petioled, opposite, and subalternate, lanceolar, obtuse, fine-veined, hard and glossy. *Panicles* terminal, ultimate divisions often umbelliferous.

A large timber tree, a native of the extensive forests of Chittagong, where it is called *Kuzza Jamb.* It flowers in April; the fruit which is eaten by boys, ripens about the beginning of the rains.

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35. E. *glandulifera. R.*

Shrubby. *Leaves* broad-lanceolate, highly polished. *Panicles* terminal, brachiate; ramifications simple and umbelliferous. *Calyx* five-toothed, and with the germs and pedicells glandular.

A native of Sumatra.

36. E. *macrocarpa. R.*

Leaves subsessile, lanceolate, acuminate, base narrow-cordate. *Peduncles* terminal, few-flowered. *Berries* spherical, of the size of a large orange, crowned with the four-lobed permanent calyx.

Chalta-jamb, the vernacular name in Chittagong, where it is indigenous in the forests amongst the timber trees. Flowering in April, and the immensely large fruit, resembling that of the Chalta, *(Dillenia indica* now called *speciosa,)* which is eaten by the natives, ripens in August and September.

37. E. *corymbosa. R.*

Leaves ovate-lanceolate, entire, smooth. *Corymbs* terminal, decompound. *Calyx* with large round divisions. *Berries* globular.

A native of the Moluccas.

MYRTUS. Schreb. gen. n. 844.

Calyx five-cleft; *petals* five. *Berry* inferior, from two to five-celled, with a few gibbous seeds in each.

1. M. *communis. Willd.* 2. 967.

Flowers sub-solitary. *Involucre* two-leaved.

Arab. Isbor.

Hind. Belatee mendee.

Common in gardens, it flowers during the cold season. I am not certain that this species

II. 498 is found indigenous in any part of India.

2. M. *tomentosa. Willd.* 2. 960.

Shrubby. *Leaves* short-petioled, oblong, three-nerved, hoary underneath. *Peduncles* axillary, one-flowered. *Bractes* two at the bottom of the germ. *Berry* oval, cells uncertain; *seeds* very numerous.

3. M. *canescens. Lour. Cochin Ch.* 381.

Arbor sinensis, &c. *Pluk. am. p.* 21. *t.* 372. *f.* 1. is good.

A native of the Island of Pulo Penang, as well as of China, Cochin China, &c.

EUCALYPTUS. L'Herit.

Calyx permanent truncated, before flowering covered with an entire deciduous lid. *Corol* none. *Capsule* inferior, four-celled, opening at top, many-seeded.

E. *moluccana. R.*

Lid conical, shorter than the calyx. *Panicles* lateral, composed of peduncled heads, of six or seven flowers. *Leaves* alternate, petioled, lanceolate, entire, firm and polished.

A native of the Molucca Islands, differing from all the species described by Dr. Smith in the 3*d vol. of the Transactions of the Linnæan Society,* in having lateral panicles, composed of heads of six or seven sessile flowers.

FŒTIDIA. Juss.

Calyx superior, four-parted. *Corol. Drupe* turbinate. *Nut* ligneous, four-celled. *Seeds* one or two.

II. 499 F. *mauritiana. Willd.* 2. 980. *Lamarck. Juss. &c.*

Found by Colonel Hardwicke indigenous on the Mauritius, in seed in the month of July. He says it is a tall, stout tree.

Stem smooth and straight, thirty feet without branches. *Branches* diverging. The *bark* very tenacious, thick, entire; surface whitish, red within, bitter and astringent. The wood-cutters strip young shoots of the bark to bundle up their wood. *Leaves* about the ends of the branches on all sides, crowded, lanceolar, entire, smooth, with mid-rib red, sessile.

PUNICA. Schreb. gen. n. 847.

Calyx five-cleft. *Petals* five. *Pome* inferior, many-celled, many-seeded.

P. *granatum. Willd.* 2. 981. *Asiat. Res.* xi. 175.

Arboreous. *Leaves* lanceolate.

Arab. Rana, or Ruman.

Pers. Anar.

Hind. Darim, also Anar.

Sung. Darimba.

Beng. Dalim, or Darim.

Gool-anar is the Hindee name of the double flowered variety; both are common in gardens throughout India.

A decoction of the bark of the root, has been found a sovereign remedy for the *Tænia*, or *Tape-worm.* For the knowledge of this valuable discovery, we are indebted to Mr. Alex-

ander Colvin, and Mr. Home of Calcutta. See Dr. Fleming's Account thereof in the 11th vol. of the *Asiat. Res.* above quoted. Page Carey Ed.

AMYGDALUS. Schreb. gen. n. 848.

Calyx five-cleft. *Petals* five. *Drupe* superior, having a shell perforated with pores. II.
1. A. *persica. Willd.* 2. 982. 500
All the serratures of the leaves acute. *Flowers* sessile, and solitary.
Arab. Tuffa-parsee.
Pers. Shooft-aloo.
Chin. To is the name of the common peach, and pinto of the flat peach.
Several varieties from China and Persia have been introduced into the gardens of India. The most uncommon is the flat peach from China, its fruit is vertically compressed, like a turnip. In Bengal they blossom in February and the fruit ripens in May.
2. A. *communis. Willd.* 2. 982.
Lower serratures of the leaves glandular. *Flowers* sessile and in pairs.
Arab. and *Hind.* Budam.
Common in Persia and Arabia I therefore conclude it is a native of those countries. It does not succeed in India, requiring much nursing to keep it alive.
3. A. *cordifolia. R.*
Leaves cordate, acuminate, gland-serrulate. *Flowers* in pairs, peduncled. *Nut* hairy.
A native of China, and now common in gardens about Calcutta, where it grows to be a large very ramous tree, and is cultivated for its small, yellow, succulent, acid fruit, of which tarts are often made. Flowering time in Bengal the cool season, the fruit ripens in the hot season.

PRUNUS. Schreb. gen. n. 849.

Calyx five-cleft. *Petals* five. *Drupe* superior, with the nut having prominent sutures. II.
1. P. *cerasus. Willd.* 2. 991. 501
Umbels sub-peduncled. *Leaves* ovate-lanceolate, smooth, folded together.
Arab. Kerasya or Jerasya.
Pers. Aloo-baloo.
A native of Persia, &c.
2. P. *armeniaca. Willd.* 2. 989.
Flowers sessile. *Leaves* subcordate.
Hind. Khoo-banee.
Arab. Bin-kook, also Tuffa-urmena.
Pers. Mishmish.
A native of China, as well as the west of Asia.
3. P. *silvatica. R.*
Peduncles short, few-flowered. *Leaves* oblong, cuspidate, finely-serrate, polished, having two glands at the base. *Bractes* ovate, sessile, pectinato-serrate.
Prunus, Hardwicke in Asiat. Res. 6. 362.
Found wild by Colonel Hardwicke, and afterwards by Mr. Francis Pierard; a tree of considerable size on the mountains north of Hurdwar.
4. P. *trifolia. R.*
Unarmed. *Peduncles* tern. *Leaves* oblong, very finely gland-serrate, smooth, in the bud equitant. *Drupes* cordate.
Chin. Hong-sum-li.
This elegant very ramous bushy shrub has been received from China, into our gardens in Bengal, where it blossoms in February, immediately after which the luxuriant foliage expands, and the fruit, which is about the size of the common plum, and nearly as palatable, ripens in May and June.
Trunk in our young cultivated trees, or rather shrubs, very short, soon dividing into II.
numerous *branches* and *branchlets* in all directions from diverging to erect. *Bark* on all 502
smooth. *Leaves* alternate, in the bud equitant, petioled, recurved, oblong, tapering equally at each end, very finely gland-serrate, considerably acuminate, smooth, from two to four inches long, and from one to two broad, in Bengal deciduous about the close of the year. *Stipules* from the base of the petioles, ensiform, gland-ciliate. *Flowers* very numerous, rather small, and white, short peduncled, regularly three from each bud, and there are generally two of those buds in each of the old axils, with a leaf-bearing one in the centre. *Bractes*, the scales of the bud, cordate, scariose, and nearly caducous. *Calyx, segments* five, oblong; *margins* glandular. *Petals* oval, short clawed, the length of the peduncles. *Filaments* about thirty, shorter than the petals. *Germ* ovate, one-celled, containing two *ovula* attached to the same side of the cell. *Style* the length of the stamina. *Stigma* large. *Drupe* cordate, with an obtuse rising at the apex, the size of the common plum, and of the same purple colour, covered with a similar bloom, grooved on one side. *Pulp* in large quantity, of a pale reddish yellow. *Seed* single, conform to the nut. *Integument* single. *Perisperm* a thin covering on one side only. *Embryo* inverse. *Cotyledons* unequal, the small one doubled, and embraced by the larger, subequitant.

ALANGIUM. Juss.

Calyx from six to seven-toothed. *Corol* from six to seven-petalled. *Germ* inferior, one-

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celled, one-seeded, attachment superior. *Drupe* one-seeded. *Embryo* inverse, furnished with a perisperm.

A. *hexapetalum. Willd.* 2. 1174.

Arboreous, with the *branchlets* sometimes ending in spines sometimes not. *Leaves* lanceolate. *Corol* from six to seven-petalled.

Greevia *salvifolia. Linn. suppl.* 409.

Greevia *montana. Kon. Mss.*

Angolam. *Rheed. Mal.* 4. *t.* 17. and Kara-angolam *t.* 26 are, I strongly suspect, at most but varieties of the same species.

Beng. Akar-kanta.

A native of Coromandel, Malabar and Bengal. It flowers during the hot season. The germ has one cell, and contains a single *ovula* attached to the top of the cell. The embryo is inverse and furnished with a perisperm. The wood beautiful.

LAGERSTROEMIA. Schreb. gen. n. 910.

Calyx six-toothed. *Petals* six, inserted by claws, and curled. *Germ* from three to six-celled; cells many-seeded, attachment central. *Capsule* superior, from three to six-celled, from three to six-valved. *Seeds* several, winged. *Embryo*, with centripetal radicle, and little or no perisperm.

1. *L. grandiflora. R.*

Arboreous. *Leaves* opposite, oblong, with an enlarged cordate base. *Panicles* terminal, drooping. *Stamina* equal, longer than the corol. *Calyx* smooth. *Capsules* six or more-celled. *Seeds* filiform.

A native of Chittagong, and the neighbouring districts. In the Botanic garden at Calcutta it was reared from seed in 1801; and when seven years old, the trees were large; it blossoms during the dry season; and the seeds ripen from April to June.

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Trunk perfectly erect and straight to the top of the trees. *Bark* smooth, ash-coloured. *Branches* subverticellate, the stout ligneous parts diverging, the very long, smooth, slender twigs drooping much from the weight of the leaves, and still more when in flower, or seed, by the additional weight of the flowers, &c. general height of the trees when seven years old from twenty to forty feet. *Leaves* opposite, approximate, short-petioled, linear-oblong, with a cordate, stem-clasping base, entire, of a firm consistence, smooth on both sides, with the lower side paler, from six to twelve inches long, and from three to five broad. *Panicles* terminal, drooping, sub-globular. *Flowers* very large, from ten to forty in the panicle, with a rather offensive odour. *Calyx* divided about half way down, into six acute, smooth, thick, fleshy permanent segments. *Petals* six, oblong, obtuse; *margins* curled, considerably longer than the segments of the calyx. *Filaments* about eighty, equal, longer than the corol. *Anthers* linear, incumbent. *Germ* superior, conic, six or more grooved, six or more celled, with innumerable *ovula* in each, attached to the large triangularly conic receptacle, rising from the bottom of the cells and longitudinally to the inner edges of the partitions. The space generally occupied by the axis being here empty. *Style* longer than the stamina, often serpentine. *Stigma* ovate, slightly divided into as many lobes as there are cells in the capsule. *Capsule* nearly round, of the size of a very small apple, with smooth, brittle, dark brown, rather thin cortex, surrounded with the permanent segments of the calyx, six or more celled, six or more-valved, opening from the apex, *partitions* longitudinally attached to the middle of the valves, and their inner margins to the inner part of the receptacles. *Seeds* numerous, very minute, linear-oblong, pedicelled, from their apex proceeds a long filiform process, or wing. *Integument* the smallness of the seed prevents me from determining whether there is more than one, it is rather hard where the embryo is lodged, but both extremities are spongy. *Perisperm* none or very thin, and not to be distinguished from the envelope. *Embryo* straight. *Cotyledons* cordate, oblong, greendotted. *Radicle* subcylindric, pointed to the base of the seed.

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2. L. *regina. Willd.* 2. 1178. *R. Corom. pl.* 1. *p.* 4. *t.* 65.

Arboreous. *Leaves* opposite, oblong. *Stamina* equal. *Calyx* variously grooved on the outside. *Capsules* six-celled.

Arjuna. *Asiat. Res.* 4. *p.* 301.

Beng. Jarool.

Adamboe. *Rheed. Mal.* 4. *t.* 20 *and* 21.

L. *Flos. Regina. Retz. Obs.* 5. *p.* 25. *and* 1. *p.* 20.

A native of Bengal, Malabar, &c. H. C. the seed ripens in August. It is a large timber tree, when in blossom beautiful. At Rangoon the timber is used to make knees for ships.

3. L. *parviflora. Willd.* 2. 1179. *R. Corom. pl.* 1. *p.* 48. *t.* 66.

Arboreous. *Leaves* opposite, oblong, downy underneath. *Peduncles* from three to six-flowered. *Stamina* unequal. *Capsule* from three to four-celled.

Teling. Chinangee.

A native of various parts of India. It flowers during the hot season; the seed ripens in August.

4. L. *indica. Willd.* 2. 1178.

Shrubby. *Leaves* nearly opposite, oval. *Petals* with long clawed and much curled. *Stamina* unequal. *Capsules* from five to six-celled.

Hind. Telinga-china.

Velaga globosa. *Gært. fruct.* 2. *t.* 133. *p.* 2.

An exotic from China; it flowers in the rainy season, but rarely ripens its seed here.

CHRYSOBALANUS. Schreb. gen. n. 850.

Calyx five-cleft. *Petals* five. *Style* lateral. *Drupe* with a five-furrowed, five-valved nut.

C. *racemosus. R.*

Leaves alternate, short-petioled, oblong, entire, smooth. *Racemes* axillary, simple, much shorter than the leaves.

A native of the Moluccas.

SONNERATIA. Schreb. gen. n. 853.

Calyx from four to six-parted. *Corol* six-petalled or more. *Capsule* superior, many-celled. *Seeds* numerous, nestling.

1. S. *acida. Willd.* 2. 999.

Petals six, narrow-lanceolate.

Rhizophora *caseolaris. Linn. syst. veg.* 442.

Mangium *caseolare. Rumph. Amb.* 3. *t.* 73.

Pagapate, *Sonnerat. it. nor. Guin. p.* 16. *t.* 10. *and* 11.

Blatti. *Rheed. Mal.* 3. *t.* 40.

A native of the Delta of the Ganges ; flowering time the hot and rainy seasons.

2. S. *apetella. Buch.*

Branchlets pendulous. *Calyx* four-parted. *Corol* none. *Stigma* peltate.

S. *apetala. Syme's Embassy to Ava.* 3. 12.

Beng. Khoura.

An elegant, pretty large tree, a native of the Delta of the Ganges. It flowers during the hot season.

LUDIA. Juss. II. 507

Calyx many-parted. *Corol* none. *Germ* superior, one-superior, one-celled, many-seeded, attachment parietal. *Berry* few or many-seeded. *Embryo* centrifugal, and furnished with a perisperm.

1. L. *spinosa. R.*

Arboreous. *Trunk* and large *branches* armed with ramous spines. *Leaves* oblong, remotely obtuse-serrulate, smooth, three-nerved.

A native of Sumatra ; from thence plants were sent by the late Dr. Charles Campbell in 1804, to the Botanic garden at Calcutta, where they began to blossom in May 1812, and ripened their fruit in September.

Compare with *spina spinarum. Rumph. Amb.* 7. *p.* 30. *t.* 19. *f.* 1. I suspect they may be the same, and more so as his tree is a native of Java, and mine of Sumatra, neighbouring Islands.

Trunk erect in trees eight years old, fully as thick as a man's leg and with the larger branches dreadfully armed with long, strong, straight, compound spines, as in *Flacourtia cataphracta. Young* shoots smooth and coloured, whole height of those young trees from fifteen to twenty feet. *Leaves* alternate, bifarious, short-petioled, oblong, very remotely and obtusely serrulate, obtusely acuminate, having both sides smooth, and the one upper lucid, triple-nerved, from four to six inches long, and from two to three broad, while young beautifully coloured. *Petioles* short, channelled. *Stipules* minute, triangular. *Racemes* axillary, solitary, simple, shorter than the leaves, few-flowered. *Flowers* small ; pale yellow, pedicelled, many of them *male hermaphrodite. Bractes* small, and solitary, under the base of each pedicel, and some round the base of the raceme also. *Flowers* about the size and appearance of those of the common myrtle, many seem abortive, though all are hermaphrodite, and in those the filaments are longer and the anthers lighter-coloured. *Calyx* saucer-shaped ; *border* twelve-parted ; six of which form an inner series, and are narrower, the whole permanent. *Corol* none. *Filaments* numerous, inserted on the disk or undivided part of the calyx. *Anthers* ovate oblong. *Germ* superior, ovate, one-celled ; *ovula* many, attached to three equidistant parietal receptacles. *Style* about as long as the stamina. *Stigma* three-lobed. *Berry* oblong, the size of an olive. *Pulp* of a soft fleshy consistence ; the taste of which is something like a bad, sweet pear, though somewhat better. *Seeds* few, roundish-oval, umbilicus pointed, attached as in the germ, and nestling in soft yellow pulp. *Integuments* two, both membranaceous. *Perisperm* conform to the seed, amygdaline. *Embryo* as extended as the perisperm. *Cotyledons* round-cordate, three-nerved. *Radicle* oval, centrifugal. II. 508

2. L. *fœtida. R.*

Arboreous, unarmed. *Leaves* oblong-serrate, smooth. *Racemes* axillary, longer than the leaves, compound. *Stigma* four-cleft.

Somer-mera, the Malay name under which it was received from Amboyna into the Botanic garden at Calcutta, where it has been for fourteen years, and for some years past blossoms freely during the rains, but has not yet produced a single full-formed seed-vessel in Bengal. The trees are now about thirty feet high, with a perfectly straight trunk of a proportionate thickness, covered with smooth, olive-coloured bark. *Branches* numerous, spreading and dividing much, the whole forming a large, ovate, very dense crown. The scent of the tree when near it, is particularly fetid.

ICOSANDRIA DIGYNIA.

CRATEGUS. Schreb. gen. n. 854.

Calyx five-cleft. *Corol* five-petalled. *Berry* inferior, two-seeded.

1. C. *crenulata. R.*

Shrubby, spinous. *Leaves* narrow elliptic, crenulate, polished. *Flowers* terminal, subracemed, pentagynous. *Berries* oblate, open at top, exposing the five seeds.

A native of Nepal; in the Botanic garden at Calcutta in eight years it has grown to the height of six or eight feet, very ramous. It flowers during the hot season, and the berries ripen in August.

2. C. *integrifolia. R.*

Procumbent, subspinous. *Leaves* obovate cuneate, entire, coriaceous, hairy underneath. *Flowers* axillary, solitary. *Calycine segments* obtusely triangular and entire.

Found by Colonel Hardwicke on the hills between Hurdwar and Sirinagur. *See Asiat. Res.* 6. *p.* 362—3.

SESUVIUM. Schreb. gen. n. 856.

Calyx or *corol* five-parted. *Capsule* superior, three-celled, circumcised, many-seeded.

S. *portulacastrum. Willd.* 2. 1009.

Crithmus Indicus. *Rumph. Amb. t.* 72. *f.* 1.

Teling. Wangaredookooroo.

A native of the sand hills near the shores of India. In flower and seed the whole year.

II. 510

ICOSANDRIA PENTAGYNIA.

MESPILUS. Schreb. gen. n. 857.

Calyx five-cleft. *Corol* five-petalled. *Germ* inferior, five-celled; cells two-seeded, attachment the base of the axis. *Berry* few-seeded. *Embryo* erect, no perisperm.

1. M. *japonica. Banks. Icon. Kæmpf. tab.* 18. *Willd.* 2. 1010.

Arboreous. *Leaves* sessile, lanceolar, very acute, serrate, downy underneath; *panicles* terminal, tomentose. *Fruits* obovate, villous.

Chin. Loquat.

From China it was introduced into Bengal where it is much cultivated on account of its excellent fruit, the beauty of the tree, and the exquisite fragrance of its flowers. In the Botanic garden at Calcutta it blossoms twice in the year, but bears fruit only once, viz. in February and March.

2. M. *bengalensis. R.*

Arboreous. *Leaves* petioled, lanceolar, remotely serrate, hard, smooth and glossy except while very young. *Panicles* terminal. *Fruit* obovate, from one to two-seeded.

A large timber tree, a native of Chittagong. Flowering time December and January, the fruit, which is not eaten, ripens in June and July.

PYRUS. Schreb. gen. n. 858.

Calyx five-cleft. *Petals* five. *Pome* inferior, five-celled, many-seeded.

1. P. *communis. Willd.* 2. 1016.

II. 511 *Leaves* ovate, serrate. *Peduncles* corymbed.

Arab. Umrood.

Pers. Nash-patee.

I have not been able to discover this tree in its native state in India, the following is the only pear, I have yet been able to find that has not been brought from Europe.

2. P. *malus. Willd.* 2. 1017.

Leaves ovate-oblong, serrate, smooth, or villous. *Umbels* simple, sessile. Claws of the petals shorter than the calyx. *Style* smooth.

Sung. Seeba.

Arab. Tuffa.

It is common all over the western parts of India, and Persia, and but very little improved by culture, consequently the varieties are few.

3. P. *cydonia. Willd.* 2. 1020.

Leaves oval, hoary underneath, quite entire. *Stipules* oblong. *Flowers* solitary.

Introduced from Europe, and from the Cape of Good Hope.

4. P. *chinensis. R.*

Leaves cordate, acuminate, finely serrulate smooth. *Stipules* filiform. *Corymbs* peduncled. *Pedicels* longer than the peduncle, hairy, with scattered filiform bractes. *Styles* smooth. *Fruit* vertically compressed.

Chin. Cha-li.

Salli is the name by which the people about Calcutta know this tree. It blossoms at various seasons, but yields few fruits, and those of a very bad quality.

5. P. *indica. R.*

Leaves cordate and ovate, most acutely and finely serrulate, smooth. *Stipules* filiform,

the length of the petioles.

A small tree, a native of the little known, mountainous districts east and north east of Silhet, while the plants are young the leaves are deeply lobate, the fruit round and smooth, a little concave at the base, from one to two inches in diameter; the taste is harsher than the common crab-apple of Europe. 512

6. P. *tomentosa. R.*

Tender parts tomentose. *Leaves* oblong, obtuse, obtusely serrate; *stipules* scarcely any.

This is the Quince tree of Hindoostan, and most likely that which furnishes the Quince seed brought from Muscat to Bengal for sale, where they are much used for medical purposes under the name Beheeke beej.

SPIRAEA. Schreb. gen. n. 862.

Calyx five-cleft. *Petals* five. *Capsules* five, superior, many-seeded.

S. *corymbosa. R.*

Shrubby, erect. *Leaves* lanceolate, serrate. *Corymbs* terminal, globular.

A native of China and of the mountains north of India, in the Botanic garden at Calcutta; it blossoms more or less the whole year, but most copiously during the hot and rainy season, but never ripens its seed.

ICOSANDRIA POLYGYNIA.

ROSA. Schreb. gen. n. 863.

Calyx pitchered, five-cleft, fleshy, contracted in the neck.

Seeds numerous, hispid, affixed to the interior side of the calyx. II.

1. R. *involucrata. R.* 513

Subscandent, armed with strong stipulary, straight prickles. *Flowers* in subsessile fascicles. *Bractes* in form of a four or five leaved laciniate, inferior calyx.

A native of Nepal and Bengal; it flowers about the beginning of the warm weather in February; its seed ripens in the rains. *Stem* and *branches* stout and ligneous, the latter often very long, subscandent, armed with strong, straight, stipulary prickles; *young shoots* villous. *Leaves* pinnate; *common petiole* villous, slightly armed, stem-clasping, base pinnatifid. *Leaflets* opposite, from five to eleven, oblong, serrate, villous underneath; the largest about an inch long, and half an inch broad. *Flowers* terminal, from one to many together, subsessile, large, pure white, sweetly fragrant. *Bractes* four or five, surrounding the base of the germ, singly they are lanceolate, acuminate, with the lower margins deeply laciniate, and villous. *Calyx* villous; *divisions* entire. *Corol* single. *Petals* obcordate. *Germ* globular, villous.

2. R. *centifolia. Willd.* 2. 1071.

Germs ovate, with peduncles hispid. *Stem* hispid, and prickly. *Petioles* unarmed.

Arab. Wurd.

Pers. Gool.

Hind. and *Beng.* Gulab.

3. R. *chinensis. Willd.* 2. 1078.

Germs obovate. *Stem* with remote, large prickles. *Peduncles* hispid. *Petioles* almost unarmed. *Leaflets* about five, broad-lanceolate, serrate, having both sides smooth. Divisions of the calyx downy on the inside.

Beng. Kanta, or Kat-Gulab.

A native of China. Flowering time the cold season. It agrees so well with Linnæus's description of *Rosa Indica*, as to induce me to think they are the same. II. 514

4. R. *glandulifera. R.*

Germs oblong, shrubby, subscandent, armed. All the tender parts ciliate, with glutinous, headed glands. *Leaflets* from five to seven, ovate, doubly-serrate. *Segments* of the calyx subensiform, finely pinnatifid. *Flowers* terminal in large corymbiform panicles.

Beng. Swet, or Sheooti gulab.

Found in gardens throughout India, where it is commonly called the white rose; its flowers being double, fragrant and white, like the white rose *(R. alba,)* of Europe. Where this plant is indigenous is uncertain, probably China, as I know it has been brought from thence to the Botanic garden at Calcutta. It blossoms all the year round; but chiefly during the cold season.

5. R. *semperflorens. Willd.* 2. 1078.

Germ globular, smooth; *peduncles* hispid. *Stems* and *petioles* aculeate. *Leaves* quinate, pinnate; *leaflets* lanceolate, serrate. *Calycine segments*, subentire, woolly on the inside.

A small, very ramous species, a native of China. In Bengal it is in constant flower, but most profusely during the cool season.

6. R. *pubescens. R.*

Germs globular. All the tender parts tomentose, and glanduliferous. *Segments* of the calyx entire; stems, branches and petioles armed. *Leaflets* seven, lanceolar, serrate.

A native of the mountains north of Rohilcund.

7. R. *recurva. R.* II.

Sub-scandent, well armed, with strong recurved prickles. *Leaflets* from five to nine, ovate-lanceolate, acutely serrate, smooth. *Stipules* subulate; *petioles* armed. 515

This stout, straggling, recurved, powerfully armed shrub is a native of Nepal; from thence it was sent by Dr. Buchanan to the Botanic garden at Calcutta, where it has now been

Page Carey Ed. ten years and has not yet blossomed. Dr. Buchanan however ascertained the genus in Nepal, where it blossoms freely.

8. R. *diffusa. R.*

Stems and *branches* weak, diffuse, armed with strong, recurved prickles in stipulary pairs. *Leaflets* five, ovate-oblong, villous; *stipules* pectinate.

This distinct species is readily known by its weak, diffuse and procumbent, very long, almost simple branches, which often rest on the ground; it is supposed to be a native of China, as it was brought from Canton to the Botanic garden at Calcutta.

9. R. *microphylla. R.*

Suffruticose, armed with straight pairs of stipulary prickles only. *Leaflets* seven or nine, minute, oval, finely and acutely serrulate; *stipules* ensiform, entire.

Chin. Hoi-tong-hong.

Introduced from Canton into the Botanic garden at Calcutta.

10. R. *triphylla. R.*

Scandent, armed. *Leaves* ternate; *leaflets* lanceolate.

From China this very extensive rambler was brought to the Botanic garden at Calcutta, previous to 1794, where it thrives luxuriantly, and is known to the Chinese gardeners in the
II. garden by the name, *Tsha-te-bay-fa.*
516 11. R. *inermis. R.*

Suffruticose, unarmed; *leaves* ternate and quinate-pinnate; *leaflets* lanceolate, serrate, smooth.

Of this very elegant small plant we have two varieties from China: one with double white flowers, called by the Chinese, *Po-mou-he-wong;* the other with double yellow flowers, *Wong-mour-he-wong.*

RUBUS. Schreb. gen. n. 864.

Calyx five-cleft. *Petals* five. Berry superior, compound grains one-seeded.

1. R. *hexagynus.*

Shrubby, scandent, armed. *Leaves* simple, oblong and oblong-cordate, serrate. *Panicles* terminal. *Flowers* hexagynous; *petals* linear, shorter than the calyx.

Hera-Chora, the vernacular name in Silhet, where the plant is indigenous. It flowers about the end of the rains, and the seeds ripen in the cool season.

Stem in full grown plants, as stout as a man's arm, with numerous, very long, climbing, round branches, and villous branchlets, all armed with small recurved prickles; when their apices rest on the ground, they strike root. *Leaves* alternate, short-petioled, simple, from oblong to ovate-cordate, serrulate, villous underneath; rib and petioles armed; from three to five inches long and from one to two broad. *Stipules* slender, and often divided into filiform, villous segments. *Panicles* terminal, large and very ramous, villous. *Flowers* numerous, small, long-pedicelled, white. *Bractes* solitary at all the divisions, from simply filiform to multifid, villous. *Calycine segments* undivided, with the end subulate. *Petals* linear, and a little shorter
II. than the calyx. *Filaments* numerous, inserted on the calyx, and nearly the length of the petals.
517 *Anthers* oval. *Germ* six, inserted in the centre of a convex, very hairy, receptacle, one-celled, containing one *ovula* attached to the top of the cell. *Style* the length of the germ, permanent. *Stigma* simple. *Seeds*, rather, *partial berries*, for they are so, from one to six, generally three or four, distinct, obliquely ovate, smooth, red and succulent; when dry wrinkled, almost chocolate-coloured. *Integuments* two, the exterior one sublucid; the inner one membranaceous. *Perisperm* none. *Embryo* inverse. *Cotyledons* ovate, conform to the seed. *Radicle* superior.

It ought to be compared with Dr. Smith's *Rubus pyrifolius.* To me it appears to differ from his figure and description, in the leaves being broader and cordate at the base; in all the calycine segments being undivided, and lastly in the petals being only a little, say one-fourth, shorter than the calyx.

2. R. *gowree phul. R.*

Shrubby, armed with recurved prickles and terminal, subpanicled. *Petals* twice the length of the calyx. Rubous. *Asiat. Res.* 6. *p.* 364.

A native of the Sewalik mountains, which bound Hindoostan on the north.

A large, bushy, perennial plant, with very long spreading and recurved branches, and somewhat five-sided, succulent; *branchlets* armed with many sharp recurved prickles, and a great quantity of long harsh diverging reddish-brown hair.

Leaves scattered, ternate. *Leaflets* oval, serrate, downy and whitish underneath, from two to four inches long. *Petioles* round, armed and hairy like the branches. *Stipules* petiolary, subulate. *Flowers* axillary, and terminal, forming small corymbiform panicles, pretty large and white. *Bractes* subulate downy. *Calyx* downy, particularly on the outside. *Petals* cuneiform-obovate, twice the length of the calyx, pure white. *Stamens* in a single series round
II. the germ, and of nearly the same height.
518 Introduced into the Botanic garden at Calcutta by Col. Hardwicke, where plants grow most luxuriantly; it blossoms during the dry months of February and March, but the berries never ripen well, nor are they so palatable as Col. H. found them in their native soil on the Sewalik mountains.

3. R. *moluccanus. Willd.* 2. 1086.

Shrubby, prickly. *Leaves* simple, cordate-ovate, serrate, downy underneath. *Panicles* terminal, with axillary umbellets.

Rubus Moluccanus latifolius. *Rumph. Amb.* 5. *p. t.* 47. *f.* 2.

A native of the Malay Archipelago.

Page Carey Ed.

4. R. *paniculatus*. R.

Shrubby and smooth. *Prickles* free. *Leaves* pinnate, quinate, ribbed, smooth, acutely serrate. *Panicles* terminal, segments of the calyx subulate; *petals* round. A native of the Moluccas. In the Botanic garden at Calcutta, it blossoms and ripens its fruit, which is rather tasteless, during the rainy and cool seasons, indeed more or less the whole year.

5. R. *rosæfolius. Smith. ic. ined.* 3. 60. *Willd.* 2. 1080.

Shrubby, erect, prickly. *Leaves* generally quinate, pinnate, green on both sides, doubly serrate, villous. *Flowers* solitary.

A native of the Mauritius. In the Botanic garden at Calcutta, where it has lately been introduced, it blossoms during the cold season.

6. R. *hirtus*. *R.*

Shrubby. *Stem* and *petioles* prickly, and very hirsute. *Leaves* ternate; *leaflets* round-oval, serrate, villous. *Panicles* terminal, composed of small umbels. *Petals* oblong, length of the calyx. II. 519

A native of the mountains of the Peninsula of India. It flowers during the cold season in the Botanic Garden at Calcutta.

7. R. *racemosus*. *R.*

Shrubby. *Stem* and *petioles* prickly and villous. *Leaves* pinnate; *leaflets* from five to seven, serrate, villous, ovate, lanceolate, the exterior ones often three-lobed. *Racemes* terminal. *Petals* as long as the calyx.

A native of the mountains of Mysore.

8. R. *rosæflorus*. *R.*

Shrubby, erect, smooth, armed, as well as the petioles, with recurved prickles. *Leaves* pinnate; *leaflets* from seven to nine, elliptic; *serratures* large and very sharp, hoary underneath. *Corymbs* terminal, hoary, sessile, shorter than the calyx.

Found by Captain Hardwicke in the vicinity of Serinagur. See *Asiat. Res.* 6. *p.* 364.

9. R. *albescens*. *R.*

Shrubby, long, scandent, or creeping, apices viviparous; armed with sharp, acute prickles, and clothed with a white bloom, which becomes brown by age. *Leaves* pinnate; *leaflets* from five to seven, from cordate to ovate, oblong-serrate, hoary underneath. *Stipules* lanceolate. *Flowers* terminal. *Petals* round, red, shorter than the calyx.

A native of the mountains of Malabar. In the Botanic garden at Calcutta it blossoms and ripens its bramble like fruit during the cool season.

10. R. *gracilis*. *R.* II. 520

Shrubby, slender, creeping, villous, armed, as well as the petioles, with recurved prickles. *Leaves* ternate, and quinate-pinnate; *leaflets* from round cordate to oblong, doubly serrate, rugose. *Stipules* petiolary, lanceolate. *Flowers* axillary, solitary. *Calyx* twice the length of the spatulate, crenulate petals.

A native of Nepal. It flowers during the hot season in the Botanic garden at Calcutta.

FRAGARIA. Schreb. gen. n. 865.

Calyx ten-cleft. *Corol* five-petalled. *Receptacle* of the seeds ovate, succulent, and coloured like a berry.

1. F. *indica*. *R.*

Roots tuberous. *Leaves* from ternate to quinate, serrate, hairy. *Peduncles* opposite to the leaves of the runners, solitary, one-flowered. All the divisions of the calyx dentate-serrate, the inner five incurved over the fruit.

It is a native of the banks of the Brahmapootra, to the east and north-east of Bengal; the fruit is perfectly insipid. It flowers during the cold season in the Botanic garden at Calcutta.

2. F. *malayana*. *R.*

Runners rooting at the joints. *Leaves* ternate; *leaflets* obovate, cuneate, dentate-serrate, a little hairy. *Peduncles* from the joints of the runners, simple, one-flowered. Exterior divisions of the calyx cuneate, and deeply (three) dentate; inner lanceolate, entire and incurved over the fruit.

A native of the tops of the mountains of Pulo Penang. In the Botanic garden in Bengal it is in flower and fruit the whole year; and the last the berries were perfectly insipid.

COMARUM. Schreb. gen. n. 869. II. 521

Calyx ten-cleft. *Petals* five, smaller than the calyx. *Receptacle* (of the seed) roundish, spongy, villous, permanent. *Seeds* naked, smooth.

C. *flavum*. *Buch.*

Annual, with slender, short, dichotomous, villous branches. *Leaves* pinnate, quinate and ternate, with obovate, gashed, villous leaflets; *stipules* lanceolate.

A native of Nepal. It flowers about the beginning of the hot season in the Botanic garden at Calcutta.

CLASS XIII.

POLYANDRIA MONOGYNIA.

TERNSTROEMIA. Schreb. gen. n. 872.

Gen. Char. *Calyx* five-leaved. *Corol* one petalled, with a staminiferous tube, and five-

Page Carey Ed. parted border. *Anthers* turbinate, with biperforate apices. *Germ* from three to five-celled; cells many-seeded; attachment interior. *Berries* superior, from three to five-celled, many seeded.

1. T. *serrata. R.*

Leaves alternate, lanceolate, serrate, acuminate. *Peduncles* in lateral fascicles, compound and decompound. *Berries* five-celled.

Daloop the vernacular name in Silhet, where it is indigenous, and grows to the size of the apple, or pear tree. It is used for fuel only. Flowering time April and May, the seed ripens in July and August.

II. 522 *Young shoots* clothed with a little grey, mealy pubescence. *Leaves* alternate, petioled, from lanceolate to oblong, serrate, acuminate, smooth, except the veins on the under side; from five to ten inches long, and from two to three and a half broad. *Petioles* about an inch long, channelled, mealy. *Stipules* none. *Peduncles* lateral, many together, drooping, divided in a triternate manner, with one flower on each of the ultimate divisions. *Flowers* small, rosy. *Bractes* small, opposite at the divisions. *Calyx* five-leaved, permanent. *Leaflets* unequal, oval. *Corol* one-petalled. *Tube* gibbous, sub-campanulate. *Border* of five, nearly round cordate, spreading segments, which are imbricated in the bud, as in the *contortæ*. *Filaments* above fifty, shorter than the tube of the corol, and inserted in a double series into it near the base. *Anthers* turbinate, two-lobed, having a circular opening in each at the top, for the discharge of the pollen. *Germ* superior, ovate, five-celled, with numerous *ovula* in each, attached to as many vertical receptacles, which project into their cells from the axis. *Style* short, five-grooved, five-parted; *segments* spreading and finally recurved. *Stigmas* transversely oval. *Berries* rather dry, nearly round; the size of a small pea, smooth, five-celled. *Seeds* a few in each cell, intermixed with a little pulp, oval, brown.

2. T. *bilocularis. R.*

Branchlets, scaly; *leaves* alternate, cuneate, lanceolate, acute, serrulate. *Flowers* in lateral fascicles below the leaves. *Berries* three-celled.

A native of the Moluccas.

Young shoots clothed with ferruginous subulate scales. *Leaves* short-petioled, cuneate, lanceolate, acute, finely serrulate, smooth, from four to six inches long and two broad. *Flowers* II. peduncled, and collected in little fascicles over the leafless branchlets, small. *Calyx* five-523 leaved; *leaflets* roundish, imbricated, smooth, permanent. *Corol* one-petalled. *Tube* very short. *Border* of five obliquely oblong, spreading, smooth segments. *Filaments* from twenty to thirty, short, broad, inserted at the bottom of the tube of the corol. *Anthers* clavate, opening, with two pores at top. *Germ* superior, ovate. *Style* short, three-cleft; *segments* long and recurved. *Stigmas* simple. *Berry* three-celled, with numerous seeds in each cell, inserted on large receptacles, rising from the axis.

BASSIA. Schreb. gen. n. 805.

Gen. Char. *Calyx* four or five-leaved. *Corol* one-petalled; *border* about eight-cleft. *Germ* superior, from six to eight-celled, cells one-seeded, attachment interior. *Embryo* erect, no perisperm.

1. B. *longifolia. Willd.* 2. 842. *Gært. sem.* 2. 104. *t.* 104.

Leaves lanceolate. *Flowers* crowded round the ends of the branchlets, drooping. *Stamina* from sixteen to twenty, within the gibbous tube of the corol.

Tam. Illupi.

A native of the peninsula of India, and found in plantations along the southern part of the coast of Coromandel. It flowers during the hot month of May, the seed ripens in August and September.

Trunk pretty straight, and of considerable thickness, but short, in proportion to the size of the tree. *Branches* numerous, dividing much, and spreading far, forming a very extensive, shady head; *young shoots* downy. *Leaves* crowded about the ends of the branchlets immediately above the peduncles, lanceolate, smooth, entire. *Petioles* from one to two inches long, round, slightly villous. *Stipules* ensiform, downy, very early caducous. *Peduncles* crowded II. round the base of the young villous shoots, twenty-three inches long, drooping, one-flowered. 524 The *bractes*, if any, fall so soon, and are so small, that I have not detected them. *Calyx* of two opposite pairs of ovate oblong, rather acute, somewhat villous leaflets. *Corol Tube* length of the calyx, gibbous, of a thick, firm, fleshy texture; *border* eight-cleft; *segments* sub-lanceolate. *Filaments* scarcely any. *Anthers* from sixteen to twenty, attached to the inside of the tube of the corol. *Germ* from six to eight-celled, with one *seed* in each, attached to the inner and under-side of the cell. *Style* twice as long as the corol. *Stigma* contracted, but evidently from six to eight-toothed. *Berry* oblong, the size of a large plum, villous, pulpy, when ripe yellowish, seldom more than three-celled, and one is more common; in the germ, always from six to eight. *Seed* solitary, oblong, of various shapes according to the number in the berries, attached to the lower half of the axis. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed. *Radicle* roundish, inferior.

I cannot account for Gærtner's large, five-celled, five-seeded berry, and suspect it belongs to some species which I have not yet met with, probably one *Rumph's Vidoricum. See vol.* i. *of his Hor. Amb. page* 173 *and* iii. 184.

Economical uses of the Illupie tree. *Bassia longifolia* by the Rev. Dr. John of Tranquebar.

1. The oil pressed from the ripe fruit is used by the natives as common lamp oil, who cannot afford to buy cocoanut oil. It is thicker, burns longer but dimmer, smokes a little, and

gives some disagreeable smell which common people do not mind. Page Carey Ed.

2. It is a principal ingredient in making the country soap, and keeps therefore often the same price with the cocoanut oil.

3. It is to the common people a substitute in place of ghee and cocoanut oil in their curries and other dishes. They make cakes of it, and many of the poor get their livelihood by selling these sweet oil cakes. II. 525

4. It is used to heal different out-breakings, such as the itch, &c.

5. The cake left after the oil is expressed, is used for washing the head, and is carried as a small article of trade to those countries where these trees are not to be found.

6. The flowers which fall in May are gathered by the common people, dried in the sun, roasted and eaten as good food. They are also bruised and boiled to a jelly, and made into small balls, which they sell or exchange for fish, rice, and various sorts of small grain.

7. The skin is taken off from the ripe fruit as well as the unripe, and after throwing away the unripe kernel, boiled to a jelly, and eaten with salt and *capsicum.*

8. The leaves are boiled with water, and given as a medicine in several diseases to both men and cattle.

9. The milk of the green fruit and of the tender bark is given also as a medicine.

10. The bark is used to cure the itch.

11. The wood is as hard and durable as *Teak* wood, but not so easily worked, nor is it procurable of such a length for beams and planks, except on clay-ground, where it grows to a considerable height, but in such a soil does not produce so many branches, and is less fruitful than when in a sandy or mixed soil, which is the best for them. In a sandy soil the branches shoot out nearer to the ground to a great circumference, and give more fruit. These trees require but a little attention and watering during the first two or three years in the dry season, and being of so great use, we have here whole plantations of them on high and sandy grounds, where no other fruit tree will grow.

12. We may still add, that the owls, squirrels, lizards, country dogs and jackals, take a share in the flowers, but the report is that the latter, especially in the time of blossom, are apt to grow mad by too much feeding on them. II. 526

2. B. *latifolia. Willd.* 2842. *Corom. pl.* 1. *No.* 19.

Leaves oblong. *Calyx* four-leaved *Stamina* from twenty to thirty, within the gibbous tube of the corol.

Madhaca, is the Sanscrit name. *See Asiat. Res.* 1. *p.* 300. *vol.* ii. *p.* 301, *and* iv. *p.* 280. Mudhooka, Guroodshpoo, Madharama, Voonaprustha, Mudhooshpootheela, Mudhoo. Mahwa, Muhooa, and Muhoola of the Bengalese.

Teling. Ipie.

A middling sized tree, a native of the mountainous parts of the Circars and of Bengal. *Leaves* deciduous during the cold season, and appearing again with the flowers in March and April. The seed ripens in July and August.

Trunk straight but short, covered with smooth, ash-coloured bark. *Branches* very numerous, the lower ones spreading horizontally. *Leaves* alternate, petioled, crowded about the extremities of the branches, oblong, rigid, smooth above, somewhat whitish below, from four to eight inches long, and from two to four broad. *Petioles* round, about an inch long. *Stipules* subulate, downy. *Flowers* numerous, crowded from the extremities of the branchlets, peduncled, at all times bowing, viz. bent with the mouth of the flower directly to the ground. *Peduncles* about an inch long, round, thickened, covered with rust-coloured down. *Calyx* as in the genus. *Corol tube* as in the genus. *Border* from seven to fourteen-parted. *Germ* ovate, hairy, from six to eight-celled, with one seed in each, attached to the upper end of the large axis. *Berry*, the size of a small apple. *Seeds* from one to four, very rarely more. *Embryo* erect, and without perisperm.

This is a very useful tree. The wood is hard, very strong, and proper for naves of wheel carriages, &c.

The flowers are eaten raw by the natives of the mountainous parts of the Circars, and by jackals. They have a sweet spirituous taste. An ardent spirit is distilled from them by the hill people, which is strong and intoxicating. II. 527

The seeds yield a large quantity of oil by expression; but it is thick, of a quality inferior to castor oil, and used only by the poorer people to burn. Large plantations of *B. longifolia* are to be found about Tranquebar, Karikal, Nagur and Nagapatam; but the proprietors do not find them answer their expectations.

On the apices of the flowers, before they open, there is frequently a drop of a whitish, soft, tasteless resin to be found.

3. B. *butyracea. Roxb. in Asiat. Res.* 8. 477.

Leaves obovate. *Calyx* five-leaved. *Stamina* from thirty to forty crowning the subcylindric tube of the corol.

Frelwa or Phulwara, of the natives of the Almora hills, where the tree is indigenous. Flowering time the month of January; the seed ripens in August. For a full account of this valuable species, see the volume of the *Asiatic Researches* above quoted.

DIOSPYRUS. Schreb. gen. n. 1598.

Gen. Char. Polygamous. Hermaphrodite. *Calyx* and *corol* four, rarely five-cleft. *Stamina* varying in every species, and often abortive. *Germ* superior, many-celled, cells one-seeded, attachment superior. *Styles* three or four, rarely five, or one and variously divided.

Page Carey Ed. *Berry* from one to twelve-seeded. *Embryo* inverse, and furnished with a perisperm.

MALE in general on a different tree. *Calyx* and *corol* as in the hermaphrodite, but with stamina more numerous, and frequently with twin-anthers.

1. *Diospyrus. Kaki. Suppl. p.* 439. *Willd.* 4. 1110.

Leaves bifarious, ovate-cordate, downy. MALE *peduncles* three-flowered. *Stamina* about
II. twenty; hermaphrodite solitary, octandrous. *Style* four-cleft. *Stigmas* bifid.
528 Kaki. *Kempf. amoen. p.* 805. 6. 7.

The Chinese gardeners employed in the Botanic garden at Calcutta call it *Chin.*

A native of China, and from thence introduced into the Botanic garden at Calcutta, by the late Col. Kyd, where it blossoms in March.

In twelve years they have only grown to be from twelve to fifteen feet high, with but few sub-erect branches. The bark is pretty smooth, but of a dark brown colour, that of the young shoots downy.

Leaves alternate, short-petioled, cordate, more or less acuminate, entire, very downy on both sides, particularly while young; from two to five inches long, and from one to four broad. *Stipules* none.

ABORTIVE HERMAPHRODITE, or rather male flowers small, yellow, sometimes on the same, sometimes on a different tree. *Peduncles* axillary, and from the base of the young shoots, recurved, short, villous, from one to three or more-flowered. *Bractes* small, caducous. *Calyx* four-cleft; *divisions* ovate, half the length of the corol. *Corol* urceolate; *mouth* four-cleft; *divisions* contorted, sub-orbicular, emarginate, becoming revolute soon after expansion. *Filaments* from sixteen to twenty-four, or even more, very short, inserted sometimes by hairs, sometimes singly round the bottom of the tube of the corol. *Anthers* sagittate, hid in the tube of the corol. *Pistil* none, or in some trees a small, conical villous gland.

FERTILE HERMAPHRODITE flowers solitary, on short drooping peduncles. *Calyx* and *corol* as in the abortive hermaphrodite, but larger. *Filaments* generally eight, short, inserted into the bottom of the tube of the corol. *Anthers* sagittate, with the barbs bearded. *Germ* superior, conical, smooth, eight-celled, attached to the top of the axis. *Style* four-cleft. *Stig-*
II. *mas* two-lobed. *Berry* nearly round, of the size of a small orange, when ripe yellow, smooth,
529 and abounding in edible yellow, fleshy pulp, covered with a firm but soft skin, eight-celled. *Seeds* one in each cell, when all come to perfection, which is uncommon, from semi-orbicular to linear-oblong, compressed, attached from the apex to the top of a soft central receptacle. *Integuments* single, firm, pretty thick, brown, polished, two-valved, with a slender, lighter coloured groove running down the back, or convex edge. *Perisperm* conform to the seed, cartilaginous, pearl-coloured. *Embryo* inverse, half the length of the perisperm. *Cotyledons* two, ovate-oblong. *Radicle* subcylindric; straight, superior, with its apex close to the umbilicus.

This tree is now pretty common about Calcutta, and I find it is not only a native of Japan but of China, and the mountains of Nepal, to the northward of Bengal. The fruit is tolerably pleasant, though by no means equal to a good apple, but what is worse, the trees about Calcutta are uncommonly unproductive.

1. D. *Ebenum. Kön. in. Suppl. pl.* 440.

Leaves short-petioled, alternate, bifarious, oblong, entire, polished. MALE FLOWERS subracemed, with about twenty anthers; HERMAPHRODITE solitary, octandrous. *Style* single. *Stigma* four-cleft.

D. *Ebenum. Suppl. p.* 440.

Hebenaster. *Rumph. Amb. vol.* 3. *p.* 13. *t.* 6. appears to be the same.

2. D. *Ebenaster. Willd.* 4. 1109.

This species is a tree of considerable magnitude, a native of Ceylon. There are many young trees in this garden, they grow slowly, and flower during the hot season, but have not yet produced fruit.

II. *Leaves* short-petioled, bifarious, alternate, oblong, entire, of a firm texture, and smooth on
530 both sides; from two to four inches long. MALE FLOWERS on a separate tree. *Peduncles* axillary, drooping, many-flowered. *Calyx* funnel-shaped: *tube* a little bellied, and considerably longer than the calyx. *Border* four-parted. *Filaments*, number uncertain, inserted into the very base of the tube of the corol; some are simple, others two, three, or even four-cleft. *Anthers* generally about twenty, that is, one on each division of the filaments.

FEMALE HERMAPHRODITE FLOWERS axillary, sub-sessile. *Calyx* beneath, four-parted, with a callous, elevated, four-lobed, permanent, marginal ring round its mouth, inside villous. *Corol; tube* cylindric, about as long as the divisions of the calyx. *Border* four-parted. *Filaments* eight, very short. *Anthers* small, sterile. *Germ* conical. *Style*, shorter than the tube of the corol. *Stigma* four-parted. *Berry* nearly globular, succulent, when ripe, yellow, and about the size of a large cherry, resting on the permanent, reflexed calyx; *cells*, eight is the natural number. *Seed*, one in each cell semi-ovate, thin on the inner edge, of a light brown colour, and smooth, united at the apex to the central receptacle.

There are many species of this extensive genus, which yield a hard, black wood. I mean, pure intensely black (not variegated,) to all of which we give the general appellation Ebony; my D. *Melanoxylon* is one. The species I am now describing, a second. *Ebenus, Rumph. Amb. vol.* 3. *p.* 1. *t.* 1, seems a third. From all these I know that of the Mauritius differs essentially, by the entire fruit, with ripe seed, just received from that Island, and now before me. The mountains of Bengal, Bootan, and Nepal produce at least another very distinct species, viz. my *tomentosum*, several young trees of which are now in this garden.

3. D. *melanoxylon. Willd.* 4. 1109. *Corom. pl.* 1. *N.* 46.

Leaves sub-opposite, oval and oblong, obtuse, villous. MALE PEDUNCLES from three to six-flowered. HERMAPHRODITE, solitary, sub-sessile with calyx and corol five-cleft. *Styles* three or four. *Berry* with as many as eight seeds. II. 531

Tumballi of the Tamuls.

Tindoo of the Hindoos.

Coromandel Ebony-tree.

Tumida of the Telingas.

The Ebony tree is a native of most woody mountainous countries in India, viz. Ceylon, Malabar, Coromandel, Orissa, &c. It grows to be very large, particularly the male tree; the wood of this sort is also more esteemed. Leaves deciduous in the cold season; the new ones appear with the flowers in April and May.

Trunk tolerably straight in large trees, from twenty to twenty-five feet to the branches, and about eight or ten in circumference. *Bark* scabrous, or deeply cracked, somewhat spongy, colour a mixture of grey and black, in irregular strata. *Branches* very irregular, numerous, rigid, forming a large spreading, shady head; *young shoots* very downy. *Leaves* nearly opposite, short-petioled, oblong, entire, obtuse, when young very downy, when old pretty smooth; about four inches long, and one and a half broad. *Stipules* none.

MALE PEDUNCLES axillary, single, short, bearing three or four small whitish flowers, supported by short bowing pedicels. *Bractes* a small one at the insertion of each pedicel, and one or two, still smaller pressing the calyx. *Calyx* and *corol* as in the genus. *Filaments* generally twelve or thirteen, short, inserted into a receptacle. *Anthers* linear, erect. *Pistil* none.

HERMAPHRODITE FLOWERS rather larger than the male, axillary, single, nearly sessile. *Bractes*, a small one pressing the calyx. *Calyx* always five-cleft, downy. *Corol* five-cleft. *Filaments* about ten, short, inserted into a receptacle between the germ and flower. *Anthers* small, seemingly sterile. *Styles* three, nearly erect; *stigma* bifid. *Berry* round, of the size of a small apple, yellow, pulpy. *Seeds* as many as eight, immersed in the pulp, kidney-shaped, sharp on the inner straight edge. II. 532

The black part of the wood of this tree is too well known to require any description in this place. It is only the centre of large trees that is black and valuable; which part is more or less in quantity, according to the age of the tree. The outside wood is white and soft, which time and insects soon destroy, leaving the black untouched. The ripe fruit is eaten by the natives; it has an astringent taste, and is not very palatable. The bark is also astringent. Powdered and mixed with pepper, it is given for the dysentery by the native doctors.

4. D. *tomentosa. Roxb.*

Dicœcous, all the tender parts very downy. *Leaves* opposite, and alternate, oval, entire. MALE PEDUNCLES three-flowered. *Calyx* and *corol* gibbous, four-toothed. *Stamens* twelve, on a receptacle. FEMALE solitary, with the calyx and corol five-parted; *berry* as far as five seeded.

Kakindoo, the Sanscrit name.

Beng. Kyou.

A native of the northern parts of Bengal, where it grows to be a tree of great size; the wood is black, hard, and heavy; in short the Ebony of that country. In a garden at Allipore, formerly belonging to Mr. Hastings, are some of the oldest trees about Calcutta. They may be about thirty years old. The trunk and whole tree very erect, tall and slender, not unlike the form of the common Cypress. The leaves are completely deciduous during the cold season, and appear again with the flowers in April.

Trunk of the trees just mentioned, erect, though not perfectly straight, with deeply cracked, spongy bark. *Leaves* sub-opposite and alternate, petioled, oval, entire, very downy while young, particularly underneath; from four to six inches long, and from two to three broad. *Petioles* short, very downy. II. 533

MALE PEDUNCLES axillary or round the base of the young downy shoots, round, recurved, very downy, three-flowered. *Flowers* small, whitish. *Bractes* small, covered with much ferruginous down. *Calyx* gibbous, very downy, four-toothed. *Corol; tube* gibbous, downy. *Border* of four cordate, downy, contorted divisions. *Stamens* about twelve, inserted on a receptacle in the centre of the corol, and shorter than its tube.

FEMALE PEDUNCLES axillary, solitary, very short, one flowered. *Calyx* five-cleft, downy on the outside, and hairy on the inside, divisions triangular, with waved reflexed margins. *Corol; tube* short, cylindric, hairy; *mouth* five-parted. *Stamens* none. *Germ* round, hairy, five-celled, with one *ovula* in each. *Styles* two. *Berry* ovate, as large as a pigeon's egg, covered with a smooth, hard bark, which becomes yellow when ripe, and is filled with a soft yellow, edible pulp. *Seeds* as far as five, when all come to perfection.

5. D. *glutinosa. König.*

Leaves linear-lanceolate, smooth. MALE PEDUNCLES from three to four-flowered, with about twenty filaments, and forty anthers. HERMAPHRODITE solitary, with from one to four. *Styles* four.

Embryopteris *glutenifera. Willd.* 4. *p.* 836. *R. Corom. pl.* 1. *N.* 70. and I suspect *Embryopteris peregrina. Gært. Sem.* 1. 115. *t.* 29. to be the same, and that by some mistake or accident, the fruit, &c. have been inverted.

Tindooka, the Sanscrit name.

Hind. and *Beng.* Gaub.

Tobacco Tendoo.

Panit-jika-marum. Rheed. Mal. 3. *t.* 41. II. 534

A middle sized tree, growing in the moist cool vallies, amongst the mountains in the Circars. *Leaves* not deciduous. *Flowering* time, March and April.

Page Carey Ed. *Trunk* erect, straight, middle sized. *Bark* pretty smooth, of a dark blackish rust colour. *Branches* spreading, scattered; *young shoots* smooth. *Leaves* alternate, short-petioled, bifarious, linear-oblong, pointed, smooth, firm, shining; when young soft and red, six inches long and two broad. *Stipules* a single variegated one which bursts and falls when the leaf begins to expand.

Male Peduncles axillary, single, bowing, bearing three four or more small white flowers. *Bractes*, a small deciduous one, below each pedicel. *Calyx* and *corol* as in the genus. *Filaments* about twenty, bifid at the point. *Anthers* about forty, linear, erect.

Hermaphrodite Peduncles axillary, single, undivided, bearing one white flower, which is considerably larger than the male. *Calyx* and *corol* as in the genus. *Filaments* one, two, three, or four, small, short. *Anthers* linear, small, sterile. *Germ* globular, eight-celled, with one *ovula* in each, attached to the top of the axis. *Styles* four, spreading. *Stigmas* branched, generally three-cleft. *Berry* globular, as large as a middle-sized apple, pulpy, rusty, yellow when ripe and covered with a rust coloured farina. *Seeds* generally eight, immersed in pulp, reniform, straight, thin at the edge. The wood of this tree is but of an indifferent quality, and not much used.

The ripe fruit is eaten by the natives, but I cannot say it is palatable; it is strongly astringent.

Sir William Jones writes me from Calcutta on the 29th December 1791, that the name by which this tree is generally known in Bengal is Gaub, (in Sanscrit it is called T*i*ndooka,) and that the astringent viscid mucus of the fruit, is used all over that country for paying the bottom of boats. The unripe fruits contain a very large proportion of Tannin. An infusion is employed to steep fishing nets in, to make them more durable, and probably adds to their strength.

II. 535 6. D. *sapota. Roxb.*

Leaves bifarious, oblong, entire, obtuse, polished. Male Peduncles many-flowered, with about sixteen hairy anthers, on eight or ten hairy filaments. Hermaphrodite solitary, with about the same number of filaments and anthers. *Berry* globular, the size of a large orange, with a few irregular-shaped seeds.

Sapotte-nigra, *Sonnerat it. nov. Guin. p.* 45. 1. 14. 15. *and* 16.

A native of the Mauritius, and from thence introduced by the late Hyder Ally, into his garden at Seringapatam; from thence in 1804, Dr. Berry of Madras sent Dr. R. good specimens, and the entire ripe fruit. Since that time the tree has been introduced from the Mauritius into the Botanic garden at Calcutta, where it grows most luxuriantly and blossoms in the hot season, but has not yet perfected its fruit in Bengal.

7. D. *ramiflora. Roxb.*

Arboreous. *Leaves* lanceolate, glossy; hermaphrodite and male flowers in fascicles from the large woody branches. *Calyx* and *corol* from five to six-parted. *Style* from five to six-cleft. *Berry* with ten or twenty seeds.

Oori-gaub, also *goolul* of the natives of the eastern frontier of Bengal, where the tree grows wild, and to a great size, and supplies the natives with very strong, hard wood. A single hermaphrodite tree only of this species grows in the Botanic garden at Calcutta. It is about twenty years old, and was brought from the hills immediately east of Tippera. Flowering time, the end of March and April; and the fruit, which is as large as an orange, takes about twelve months to ripen.

Trunk straight. *Branches*, numerous, spreading; *branchlets* alternate, bifarious. *Bark* II. of the old woody parts smooth, of a dark olive brown, that of the young parts smooth and 536 green. *Height* of the individual tree in this garden about sixteen feet; on the mountains of Tippera, Silhet, &c. where indigenous, they grow to a great size; but it is evidently a tree of very slow growth, as are most, if not the whole of the genus. *Leaves* alternate, bifarious, short-petioled, lanceolate, acute, entire, of a firm texture, and deep smooth shining green on both sides, from six to ten inches long, and about two or three broad. *Flowers* collected in small, subsessile fascicles, over the thick woody branches, the hermaphrodite ones on one tree, and the male ones on another. The short, thick, scaly peduncles and calyx are clothed with much dark, olive-coloured down; the corol white and smooth. *Calyx* five or six-toothed, half the length of the tube of the corol. *Corol* one-petalled; *tube* somewhat gibbous, margin five or six-parted; *divisions* contorted, sub-reniform, at first spreading then revolute. *Filaments*, ten or twelve, inserted into the base of the tube of the corol. *Anthers* sub-sagittate, small, and containing little pollen, whence I conclude there is a male tree, which I have not yet seen. *Germ* in the hermaphrodite flowers ovate, smooth. *Style* short. *Stigmas* five or six, thickening, expanding. *Berry* globular, a large apple, slightly scabrous, resting on the very thick enlarged calyx, replete with yellowish edible pulp. *Seeds* ten or twelve, oblong, thin on the inner edge where they are united to the central receptacle.

8. D. *racemosa. Roxb.*

Leaves from oblong to lanceolar, obtuse, glossy. Both male and hermaphrodite flowers on axillary, comose racemes, the former with twenty or thirty stamina, the latter with twelve or sixteen; *germ* four-celled. *Style*, none; *stigma* four-cleft. *Berries* round, smooth, with as many as four seeds.

II. *Goolul*, the vernacular name in Silhet.

537 A middling sized tree, a native of the mountainous countries east of Bengal, where it blossoms in April; the fruit ripens in November, and is eaten by the natives.

9. *D. lanceæfolia. R.*

Leaves short-petioled, lanceolate, and polished. *Flowers* sessile; the male flowers crowded

in axillary heads; the hermaphrodite solitary.

Page Carey Ed.

Goolul the vernacular name in Silhet, where it grows to be a pretty large tree, and furnishes the natives with hard durable timber, for the construction of their habitations, &c. Flowering time in April; the fruit is edible.

Leaves alternate, bifarious, short-petioled, lanceolate, entire, lucid; texture particularly hard; from four to six inches long, and from one to two broad.

Male Flowers sessile, and crowded together in the axills of the present leaves as well as in those of last year; it is the only species I have yet met with that has sessile flowers. *Calyx* downy, four-toothed. *Corol* with gibbous tube and imbricated four-parted border. *Filaments* about sixteen, short, inserted into the receptacles. *Anthers* linear.

Hermaphrodite *Flowers* axillary, solitary, sessile, cernuous. *Calyx* downy, from four to five-toothed; from the apex a keel runs down on the outside. *Corol* downy on the outside. *Tube* gibbous. *Border* from four to five-parted; *segments* cordate, imbricated in the bud. *Filaments* from eight to ten, short, inserted on the base of the tube of the corol. *Anthers* linear. *Germ* hairy, ovate, torulose, eight-celled, with one *ovula* in each attached to the top of the axis. *Style* scarcely any. *Stigma* with about as many short divisions as there are cells in the germ.

10. D. *sylvatica. Willd.* 4. 1108. *R. Corom. R.* 1. *No.* 47.

Leaves from oval to oblong, smooth. Male peduncles many-flowered, with about eighteen single-anthered filaments; female hermaphrodite, solitary, with an ample calyx. *Berry* with as many as eight seeds. II. 538

Tella-goda of the Telingas.

A native of the Circars, where it blossoms during the hot season.

11. D. *montana. Willd.* 4. 1110. *R. Corom. pl.* 1. *N.* 48.

Armed. *Leaves* ovate-oblong, smooth. Male flowers numerous, with about eight filaments, and sixteen anthers; female hermaphrodite solitary, with only four sterile stamina, as many as eight seeds.

Yerra-goda of the Telingas.

A native of the Circar mountains; it flowers during the hot season.

12. D. *chloroxylon. Willd.* 4. 1112. *R. Corom. pl.* 1. *N.* 49.

Armed. *Leaves* oblong, downy underneath. Male flowers fascicled, with about twelve filaments and sixteen anthers; hermaphrodite solitary, with about eight single stamina; *styles* four. *Berry* two or three-seeded.

Nella-woolimera of the Telingas.

A native of the Circars; it flowers during the hot season.

13. D. *cordifolia. Willd.* 4. 1111. *R. Corom. pl.* 1. *N.* 50.

Armed. *Leaves* linear-cordate, downy. Male peduncles three-flowered, with about eight filaments and sixteen anthers; hermaphrodite single, with twelve single stamina; *styles* four. *Berry* eight-seeded.

Tumala; the Sanscrit name.

Teling. Kok wolimera.

Beng. Bun-Gaub.

Found over most parts of India, and with the whole of the other species blossoms during the hot season, that is, from the beginning of February to the end of May.

14. D. *stricta. R.* II. 539

Trunk straight to the top of the tree. *Leaves* ovate-lanceolate. Male peduncles from three to six-flowered; *stamina* sixteen on a convex receptacle.

A tall slender conical tree with a trunk perfectly straight, as in the Firs, to the very top; a native of Tipperah; it flowers in March.

The female tree unknown.

15. D. *bracteata. R.*

Leaves oblong, acute. *Fertile flowers* solitary and bracted: *styles* four. *Berry* with as many as eight seeds.

A native of the Dooab; the male tree has not been found.

SYMPLOCOS. Schreb. gen. n. 1223.

Gen. Char. *Calyx* superior, five-parted. *Corol* one-petalled, rotate, with the stamina inserted on its base. *Germ* semi-infera, three-celled; cells few-seeded; attachment to the upper end of the axis. *Drupe* inferior, thirteen-celled. *Seeds* one or two. *Embryo* inverse, and furnished with a perisperm.

1. S. *racemosa. Roxb.*

Racemes axillary. *Leaves* oblong, smooth, serrulate.

Sans. Savura, Lodhra.

Beng. Lodh.

A small tree of from twelve to twenty feet high, a native of Burdwan and Midnapore in Bengal. Flowering time the month of December; the seed ripens in May.

Compare this plant with *Myrtus Retz. obs.* 4. *p.* 26.

Trunk about twenty inches in circumference. *Bark* somewhat rough, with a spongy, friable, exterior grey coat, inwardly of a firm, fleshy texture; when fresh, of a very pale yellowish colour and the taste mildly astringent. *Leaves* alternate, short-petioled, from ovate-oblong to broad-lanceolar; margins serrulate, both sides smooth, of a thick firm texture, from two to six inches long, and from one to one and a half broad. *Stipules* none. *Racemes* axillary and terminal, single and generally simple, shorter than the leaves, many-flowered. *Flowers* soli- II. 540

Page Carey Ed. tary, approximate, small, short-peduncled; *colour* a lively yellow. *Bractes* three to each flower, ovate, villous, one, viz. the largest under the pedicel, and two placed opposite at the base of the germ. *Calyx* superior, five-parted, permanent; *segments* broad-ovate or nearly round-obtuse. *Corol* one-petalled, rotate. *Border* five-parted; *segments* oval, deeply divided, concave, smooth, thrice the length of the calyx or more. *Filaments* numerous, as long as the corol, and inserted into its base. *Anthers* small, two-lobed. *Germ* inferior, turbinate, three-celled, with from two to four *ovula* in each, attached to the inner and upper angle of the cells (upper end of the axis.) *Style* shorter than the stamina. *Stigma* three-lobed. *Drupe* oblong, smooth, with a beautiful purple pulp in small quantity, when ripe purple, crowned with the permanent calyx. *Nut* conform to the drupe, three-celled. *Seed* generally solitary, (with the abortive integuments of the other one or three close by its apex) linear-oblong, attached to the inside of the top of the cell. *Integument* seems single, tough, and thick, colour on the outside light brown. *Perisperm* conform to the seed, rather soft. *Embryo* cylindric, inverse. *Cotyledons* small, oblong; *radicle* three or four times longer than the cotyledons, cylindric, superior.

The bark of this small tree is in request amongst the dyers of red in Calcutta, and is met with in the markets in that city for a trifling price.

II. 541 It seems to be used as a mordant only. To dye with Munjeet (East India madder,) in which the bark called *Lodh* is an ingredient. For three yards of cloth take *Lodh*, the bark is meant, *Bura Hur (Myrobolana Chebula. Mat. Med. Terminalia chebula Roxb.)* of each one chatuk, or two ounces, pound and rub them with water on a stone; mix them up with water, and steep the cloth in it, then dry it. Take one chatuk of alum, dissolve it in water, and boil it, put the cloth into this solution, and let it boil for an hour, then wash and dry it. Then take *Al*, viz. *Morinda tinctoria. Roxb.* one chatuk Dhawra flowers, *Grislea tomentosa. Roxb.* one chatak *Munjeet Rubia Munjeet. Roxb.* half a seer, nearly a pound, separately, mix them with lukewarm water, and let it boil. Then put in the cloth, and let it remain boiling for forty minutes.

Aboor the red powder used by the natives during the *Hoolee* holidays is made about *Kheerpaee*, of the bark of this tree.

2. S. *spicata. Roxb.*

Leaves from lanceolar to oblong-serrate, acute. *Spikes* axillary, compound. *Drupes*, curceolate-torose; *nut* one-celled, one-seeded.

Booree, the vernacular name in Silhet, where it is indigenous, growing to be a middle-sized tree. It flowers in August, and the seeds ripen in the cold season. They are very hard, about the size of a pea, and resemble a minute fluted pitcher; when bored, they are strung like beads, and by the natives put round the necks of their children, to prevent evil. The nuts only of *Nageia Putranjiva* are employed in the same manner, and for the same end.

Young shoots smooth and straight. *Leaves* alternate, short-petioled, from lanceolar to oblong-serrate, acuminate, smooth, texture hard, and in drying turn yellow; from four to six inches long and one and a half broad. *Stipules* none. *Spikes* axillary, solitary, compound, I may say panicled, scarcely half the length of the leaves, smooth. *Flowers* numerous, sessile, small, scattered, yellow. *Bractes* three, roundish, concave and ciliate, embracing the base of each germ, like a calycle. *Calyx* superior, five-parted, the five oblong segments being only slightly united at the base into one ring with the insertion of the filaments. *Filaments* about forty, twice the length of the corol. *Anthers* two-lobed. *Germ* inferior, three-celled, with three or four *ovula* in each, attached to the axis. *Style* the length of the filaments. *Stigma* large and perforated. *Drupes* the size of a pea, short, urceolate, torose, about twelve-ribbed, olive-coloured. *Nut* conform to the whole drupe, thick and hard, one-celled, cell annular, &c. conformable to the cell in the nut. *Integument* single. *Perisperm* conform to the seed, oily. *Embryo* shorter than the perisperm, arched. *Cotyledons* semi-columnar. *Radicle* cylindric, much longer than the cotyledons.

II. 542

3. S. *ferruginea. Roxb.*

Leaves lanceolar, serrulate, acuminate, parallel-veined, downy underneath. *Spikes* axillary, solitary, compound, downy.

Foolinazur is the vernacular name in the Garo country, where it is indigenous; it grows to the size of a small tree, with much soft, ferruginous pubes. Flowering time the latter part of the rains.

Leaves alternate, short, villous, petioled, lanceolar, serrulate, acuminate, texture hard; smooth above, downy underneath; from four to seven inches long, and from one to two broad. *Stipules* none. *Spikes* axillary, solitary, compound, not half the length of the leaves, very downy. *Flowers* sessile, crowded, middle-sized, yellow. *Bractes* three to each flower, like a calycle, broad ovate, downy. *Corol* rotate. *Tube* very short; *segments* of the border five, oblong. *Filaments* numerous, inserted on the sharp tube of the corol. *Anthers* two-lobed. *Germ* semi-inferior, downy, three-celled; cells with from two to four *ovula* in each, attached to the upper end of the axis. *Style* the length of the stamina. *Stigma* three-lobed.

II. 543

MIMOSA. Schreb. gen. n. 1595.

Gen. Char. Aggregate. *Calyx* five-toothed. *Corollets* one, diadelphous *legume*. I call them *corollets* because inclined to consider the whole as one *aggregate* flower.

SECT. I. *unarmed Spikes globular.*

1. M. *Kœringa. R.*

Leaves conjugate-pinnate; *leaflets* three pair, short, petiolate, lanceolate, when young highly coloured. *Panicles* axillary, and lateral. *Legumes* many-jointed, spiral; *seed* enveloped in an edible fleshy arill. Page Carey Ed.

A large unarmed tree, a native of the peninsula of Malacca, where it is called *Kœringa* by the Malays. The legumes are very large and spiral, like a cork screw; the joints are nearly circular, compressed, and often two inches in diameter; each containing a single seed, as large as a common garden bean, covered with a considerable quantity of edible fleshy pulp.

2. M. *Xylocarpa. R. Corom. pl.* 1. *N.* 100.

Leaves conjugate pinnate; *leaflets* from two to four pair, with a single one on each side below the pairs. *Stipules* lanceolate. *Spikes* axillary, round, long-peduncled; *corollets* deciduous. *Legumes* falcate, ligneous, many-seeded.

Acacia *xylocarpa. Willd.* 4. *p.* 1055.

Teling. Konda-tangeroo.

It is called Pingadoo in Pegu, where it is used for knees, crooked timbers, &c. in ship building.

A large stately timber tree; a native of various parts of India. It blossoms during the hot season, at which period it is nearly destitute of foliage. The timber is remarkably strong and durable. II. 544

3. M. *lucida. R.*

Leaves bipinnate, and conjugate-pinnate; *pinnæ* one or two pair; *leaflets* from one to three pair, oblong, lucid. *Spikes* terminal, sub-panicled, round; *corollets* from ten to twelve, monadelphous.

A large and beautiful tree, a native of the mountains north east of Bengal. Flowering time the hot season.

4. M. *monadelphà. R.*

Leaves bipinnate; *pinnæ* and *leaflets* about two pair of each, the latter obliquely oblong and smooth. *Panicles* terminal. *Tube* of the numerous united filaments very long. *Legume* pedicelled, one or two-seeded. *Nut* black uncertain.

5. M. *Sirissa. R.*

Arboreous. *Leaves* bipinnate, *pinnæ* from two to three pair. *Spikes* axillary, round; corollets monadelphous. *Segments* leafy, dry, long-linear and broad, not opening spontaneously.

Sirisha, or Shirish in Sanscrit and Bengalee.

Teling. Durshuna.

This tree is very common in every part of India; all soils and situations seem to please it equally. It grows to be a pretty large tree, but with a short thick trunk covered with ash-coloured bark. It has a very extensive but thin head. Flowering time the hot and rainy season; the greatest part of its leaves drop during the cold season.

Leaves about the ends of the branchlets bipinnate, and about a span long. *Pinnæ* from two to four pair, sometimes the lower pairs are somewhat alternate. *Leaflets* opposite, from four to eight pair, obliquely linear-oblong, slightly emarginate, otherwise entire, smooth, about an inch and a half long and three-fourths broad. *Petioles common*, round, tapering, with a large gland, a little above its base on the upper side, and sometimes one at the extremity; there are also two small glands near the base of the partial petioles, and smaller ones between the leaflets, but their presence and number is always uncertain, except those near the base. *Peduncles* axillary, one, two, or more, each supporting a globular head, of white, fragrant corollets. *Filaments* numerous, united below, monadelphous, very long. *Legume* leafy, from six to twelve inches long, and from one to two broad. *Seeds* from eight to ten, remote, lodged in the middle, where the legume is alternately elevated and depressed. II. 545

The wood of this tree, is much like that of *M. Xylocarpa*, and equally serviceable. The flowers are very fragrant. I have often seen large masses of very pure gum upon it.

6. M. *heterophylla. R.*

Arboreous. *Leaves* bipinnate, *pinnæ* from two to three pairs; *leaflets* from three to six pairs, varying in shape from unequally round-cordate to lanceolar. *Panicles* axillary; *corollets* pedicelled, monadelphous. *Legumes* entire, spirally twisted, into one or more circles.

Kawahurunee the verhacular name in Silhet, where it grows to be a large and useful timber tree. It flowers in February, March, and April; its seed ripens in May or June.

Young shoots angular and smooth. *Leaves* alternate, bipinnate, from six to twelve inches long. *Pinnæ* from two to three pairs. *Leaflets* from two to three pairs on the lower pinnæ, from five to six the exterior; the inferior pairs small, say from half an inch to an inch each way, and unequally cordate: the exterior pairs from four to five inches long, and one and half broad; all are firm, entire, and glossy. *Petioles, common* and *partial*, smooth. *Glands*, a large umbilicate one at the base of the common petioles and one between each pair of pinnæ and leaflets. *Panicles* axillary, crowded; *divisions* umbelled even to the globular heads of corollets. *Calyx* five-toothed. *Corol* tubular, four times longer than the calyx; mouth five parted. *Filaments* many, twice the length of the corol, united toward the base, and inserted on the bottom of the tube of the corol. *Anthers* oval, incumbent. *Germ* pedicelled, lanceolar. *Style* the length of the stamina. *Legume* entire, not articulate, contracted between the seeds, spirally twisted into one or more circles, smooth and brown on the outside, orange on the inside. *Seeds* from six to eight, remote, of the size of a kidney-bean, smooth, deep black. II. 546

7. M. *trapezifolia. R.*

Leaves bipinnate; *pinnæ* from three to four pairs; *leaflets* from four to seven pairs, trapeziform, downy underneath. *Panicles* terminal, ultimate divisions three; composed of small umbellets of spherical heads of monadelphous corollets.

Page Carey Ed.

A native of the Molucca Islands; it is the only species I know, that bears its flowers in umbellets.

8. M. *odoratissima. R. Corom. pl.* 2. *No.* 20.

Leaves bipinnate; *pinnæ* from three to four pairs; *leaflets* ten pairs; *panicle* terminal; spikes round; *corollets* monadelphous. Legumes thin, linear.

Acacia odoratissima. *Willd.* 4. *p.* 1063.

Teling. Shinduga.

Tam. Solomanim.

A native of Coromandel. It flowers during the hot season, the tree is large and handsome, the timber particularly hard and strong. *Flowers* with a *gland* considerably above the base of the petiole.

9. M. *elata. Roxb.*

II. 547 Arboreous. *Leaves* bipinnate; *pinnæ*, from three to five pairs, *leaflets* from six to ten pairs, oblong, a concave gland on the base of the petiole. *Panicle* axillary, compound. *Spikelets* globular. *Stamens* monadelphous. *Legumes* linear, thin, from six to eight seeded.

A large, tall, most stately and excellent timber tree, a native of the interior parts of Bengal. In the Botanic garden at Calcutta it blossoms at the close of the rains, and the seed ripens during the dry season.

Trunk of trees sixteen or seventeen years old, from twenty-five to thirty feet to the branches, and from four to five feet in circumference, four feet about the ground. *Bark* in the above trees still smooth; but in old trees it is cracked in various directions, and of a dark ash colour. *Branches* spreading to a great extent; *young shoots* flexuose and smooth, the whole height of the just mentioned young trees is from fifty to seventy feet.

Leaves bipinnate, from one to three feet long; *pinnæ* from three to six pairs; four is the most common. *Leaflets* from six to ten pairs, subsessile, opposite, oblong, emarginate, smooth on both sides, from one to two inches long. Petioles with a ridge on the upper side, and one large, oblong, concave, brown gland near the base of the common one, and generally one between or rather below the last one, two, or three pairs of leaflets. *Racemes* or *panicles* axillary, generally compound, being composed of several diverging, pedicelled, globular heads of white corollets. *Calyx* subcylindric, five-toothed. *Corol* funnel-shaped, five-cleft, twice the length of the calyx. *Stamens* numerous, monadelphous, twice the length of the corol. *Germ* oblong. *Style* rather longer than the stamens. *Stigma* minute. *Legume* linear, pointed, smooth, thin (leafy) six inches long and scarcely one broad. *Seeds* from six to eight.

10. M. *Kalkora. R.*

II. 548 Arboreous. *Leaves* bipinnate; *pinnæ* from four to six pairs; *leaflets* from fifteen to thirty pairs, sublinear, smooth; there is a smooth, convex gland on the base of the common petiole, and one at the last pair of pinnæ.

Beng. Kalkora.

A large timber tree; a native of the hills in the vicinity of Gwalpara, and from thence brought to the Botanic garden by Mr. R. Kyd.

11. M. *procera. R. Corom. pl.* 2. *No.* 21.

Leaves bipinnate; *pinnæ* four pairs; *leaflets* ten pairs; *stipules* ensiform. *Panicles* terminal and axillary. *Spikes* thereof round; *corollets* monadelphous. *Legumes* linear-lanceolate, pointed.

Acacia procera. *Willd.* 4. *p.* 1063.

Teling. Pedda-Patseroo.

A native of Coromandel, where it grows to be one of their largest trees.

12. M. *pulchella. R.*

Arboreous. *Leaves* bipinnate; *pinnæ* from nine to ten pairs; *leaflets* from twenty to twenty-five pairs, linear-oblong, glaucous; there is a gland above the base of the common petiole. *Stipules* subulate.

A most beautiful, stately tree, with an immensely large, dense head, the larger branches spread much and the smaller droop, but what renders it most conspicuous is the dark bluish grey colour of its numerous large leaves.

It is a native of Malabar, and from thence was sent to the Botanic garden at Calcutta by Dr. A Berry.

13. M. *amara. R. Corom. pl.* 2. *No.* 122.

Leaves bipinnate; *pinnæ* ten-pair; *leaflets* twenty-pair; *stipules* lanceolate; *spikes* axillary, crowded, peduncled, round; *corollets* monadelphous. *Legumes* thin, linear and broad.

II. 549 Acacia *amara. Willd.* 4½. 1074.

Teling. Nella renga.

Tam. Shekram.

A middling sized tree, a native of Çoromandel.

14. M. *fructicosa. R.*

Shrubby, smooth. *Leaves* bipinnate; *pinnæ* from eight to ten pair; *leaflets* from ten to twenty pair, sub-falcate, minute, a gland toward the base of the common petiole. *Stipules* minute, subulate.

From China it has been introduced into the Botanic garden at Calcutta, under the Chinese name *Tham-yeaongton.*

15. M. *stipulacea. R.*

Leaves bipinnate; *pinnæ* from ten to twenty pair; *leaflets* numerous, scymitar-shaped; *stipules* and *bractes* semicordate. *Panicles* terminal; *spikes* pedicelled, globular; *corollets* monodelphous. *Legume* linear, leafy, from six to twelve-seeded.

Beng. Amlooki.

A native of the mountains north of Bengal. It flowers during the hot season, and is probably the largest of the genus; for I have seen a young (say twenty years old) tree which measured thirteen feet in circumference, five feet above ground; one in the Botanic garden, planted by myself was forty-eight and a half inches in circumference four feet above the ground, when only seven years old.

16. M. *microphylla. R.*

Sub-arboreous. *Leaves* bipinnate; *pinnæ* from ten to fifteen pair; *leaflets* from three to five pair, obliquely-linear. *Panicles* terminal; *corollets* monodelphous. *Legumes* thin, few-seeded.

Tetooleeya, the vernacular name in Silhet where it grows to the height of twelve feet. Flowering time, May and June; the seed ripens in March and April.

Young shoots dark brown and scarcely villous. *Leaves* bipinnate, from six to eight inches long, of a bright green colour. *Pinnæ* from ten to fifteen pair. *Leaflets* from thirty to forty pair, minute, obliquely-linear, smooth. *Petioles common* and *partial*, downy. *Panicles* terminal and axillary, villous, composed of globular heads of minute greenish-yellow corollets. *Bractes* subulate, villous. *Calyx* and *Corol* as in the genus, both villous. *Filaments* from ten to twenty, monodelphous. *Germ* long-pedicelled. *Legumes* thin, leafy, smooth, long, broad, obtuse-pointed, from three to six-seeded, from six to eight inches long and rather above one broad. *Seed* oval, flat, smooth, light brown.

With the bark of this tree the mountaineers make an intoxicating liquor which they drink as we do beer; on the Coast of Coromandel the natives distil an ardent spirit from a fermented mixture of the bark of *Mimosa leucophlea*, coarse sugar, and palm-wine.

17. M. *Smithiana. R.*

Arboreous. *Leaves* bipinnate; *pinnæ* from twelve to fifteen pair, *leaflets* thirty pair, semi-lanceolate. *Panicles* terminal; *corollets* monodelphous. *Legumes* thin, linear, from ten to twelve-seeded.

Suris, the vernacular name in Silhet, where it is indigenous, and grows to be a very large tree. Flowering time May, the seed ripens in December.

Young shoots somewhat angular, a little villous, and spotted with light grey dots. *Leaves* alternate, bipinnate, about a foot long, greenish. *Pinnæ* from twelve to eighteen pair. *Leaflets* numerous, from twenty to forty pair, semi-lanceolate, scarcely half an inch long, and about one-fourth of that in breadth. *Petioles common* and *partial*, villous. *Glands* one near the base of the common petiole, and one between each of the last two or three pairs of pinnæ. *Stipules* semi-cordate, in young luxuriant plants remarkably large, viz. one inch and a half long and one broad. *Inflorescence* terminal, panicled, and in the exterior axills a single, long-pedunded raceme, all composed of long-pedicelled globular heads of white corollets, the whole downy. *Calyx* and *corol* as in the genus, and both villous. *Filaments* from twelve to fifteen, very long, united toward the base into a tube which is inserted into the bottom of the tube of the corol. *Germ* pedicelled. *Style* as long as the stamina. *Legumes* linear-lanceolar, thin, straight-margined, and smooth, from three to four inches long and rather under one inch in breadth, from ten to twenty-seeded. *Seeds* oval, much flattened, smooth, of a greyish olive-colour.

18. M. *pedunculata. R.*

Arboreous. *Leaves* bipinnate, *pinnæ* from twenty to forty pair, sub-alternate; *leaflets* from sixty to a hundred pair, a pair of umblicated glands on the base of the petiole, and one between each of the last, from four to eight pair. *Spikes* subcla rate, *corollets* monodelphous, decandrous.

An elegant tall large tree, a native of the Islands to the eastward of the Bay of Bengal, where it blossoms in May, and the seed ripens in December. The Malays are said to be fond of the seeds, which taste like garlic, and of the mealy matter which surrounds them, as in M. *biglobosa* to which it is in many respects nearly allied.

19. M. *biglobosa. Jacq. Amer.* 267. *t.* 179. *f.* 87.

Arboreous. *Leaves* bipinnate; *pinnæ* from ten to thirty pair; *leaflets* from twenty to thirty pair, linear, an umbilicated gland on the petiole below the lower pair of the pinnæ, and one between each of the last three or five pair. *Panicles* terminal. *Spikes* few, long-pedunculed, clavate; *corollets* decandrous, monodelphous. *Legumes* linear, many-seeded, in a mealy pulp.

Beng. Supota.

A native of the forests of Silhet, and its neighbourhood, where it grows to be a large tree, flowering in December, and ripening the seed in April.

Trunk straight, when full grown about two feet in diameter, or six in circumference; *young shoots* villous. *Leaves* scattered, bipinnate, from twelve to twenty-four inches long, from ten to twenty pair; *pinnæ* opposite, from three to six inches long; *leaflets* from twenty-five to fifty pair, linear, lucid, half an inch long. *Petioles common* and *partial*, villous; *glands* an umbilicated one under the lower pair of pinnæ, and one between each of the last three, four, or five pair. *Stipules* minute, subulate. *Panicles* terminal, composed of a few, alternate, very long pedunculed, loose, sub-lateral, pale yellow fragrant spikes (or flowers.) *Bractes* or scales of the clavate receptacle, solitary under each corollet, spatulate with the apex broad, and villous on the out side. *Calyx* tubular, mouth cut into five unequal, roundish, villous segments. *Corol* five-parted. *Filaments* ten, united from the middle downwards. *Germ* linear, many-seeded. *Style* the length of the stamina. *Legumes* about a foot long, and an inch and half broad, flat, swelled at the seeds, where a quantity of mealy matter is found to surround each seed; surface smooth, brown when ripe, in a manner jointed, except when very old. *Seeds* from twelve to twenty, oval, smooth, dark brown.

Note. About the base of the spikes on the sub-cylindrical part, the corollets are generally

Page Carey Ed. II. 550 II. 551 II. 552

Page male-neuter.
Carey Ed. 20. M. *triquetra. Vahl. Symb.* 3. 102.

Bi-triennial, prostrate. *Leaves* bipinnate: *pinnæ* two pairs; *leaflets* from ten to twelve pair. *Peduncles* axillary, solitary, bracted; *spikes* round, erect; *corollets* five-petalled, decan-
II. drous. *Legumes* linear, from four to six-seeded.
553 Desmanthus *triquetrus. Willd.* 4. 1045.

A small procumbent species, a native of Coromandel. In flower and seed the whole year.

SECT. II. *Unarmed. Spikes cylindric.*

21. M. *natans. Corom. pl.* 2. *N.* 119.

Annual, flowing. *Leaves* bipinnate; *pinnæ* from two to three pairs; *leaflets* ten pairs. *Stipules* obliquely-cordate. *Flowers* axillary, five-celled, decandrous, the lower ones barren. *Legume* falcate, many-seeded.

Desmanthus *natans. Willd.* 4. 1044.

Nitti-todda-vaddi. *Rheed. Mal.* 9. *t.* 20.

Neptunia *oleracea. Lourier. Cochin Ch.* 804.

Beng. Panee-lajuk.

Teling. Neeroo tavulupoo, and Nidra-yung.

This species is annual; it is found growing on pools and lakes of sweet water, or where water has stood. Flowering time the wet and cold seasons.

Branches or *stems* round, jointed, flexuous piped, tufts of radical fibres from the joints, between the joints spongy bodies are formed, which prevent the plant from sinking, the roots have not any connection with the earth, except when the water leaves it, and then it soon perishes.

Leaves alternate, bifarious, bipinnate; *pinnæ* two or three pair, opposite. *Leaflets* from eight to twelve pairs minute, smooth, possessing much sensibility, I think next to that of M. *pudica. Stipules* cordate, caducous. *Peduncles* axillary, single, longer than the leaves, supporting an oblong head of fertile and neuter florets. *Bractes* solitary, lanceolate, one-flowered. *Fertile flowers* above, decandrous. *Calyx* five-toothed. *Corol* five-petalled. *Legumes* falcate, acute, smooth, from six to eight-seeded, torose. *Neuter flowers* below the fertile ones. *Calyx* and *Corol* as in the genus, but the ten stamens are here ten linear, lanceolate, waved, yellow
II. petals.
554 *Note.* It agrees pretty well with Miller's figure of M. *plena*, but the East Indian plant wants the bractes on the middle of the pedúncles. The flowers are either neuter or hermaphrodite, and the latter have always ten stamens. Plukenet's 4th figure of plate 307 is certainly intended for this plan.

22. M. *adenanthera. R.*

Terminal, erect, smooth. *Leaves* bipinnate; *pinnæ* three pair; *leaflets* from twenty to thirty pair with coloured margins. *Stipules* obliquely cordate, acute. *Peduncles* axillary, bracted; *spikes* ovate, nodding, inferior corollets double, neuter; the superior ones, decandrous; *anthers* crowned with a gland. *Legumes* sub-falcate, many-seeded.

Native place uncertain. Flowering time in Bengal the rainy season. It is a pretty slender, somewhat flexuous, sub-erect, shrubby plant. It is nearly allied to Willdenow's *Desmanthus punctatus;* if the anthers have a gland on the apex, as in *Adenanthera*, I think we may conclude they are the same.

23. M. *scandens. R.*

Scandent. *Leaves* bipinnate, ending in a tendril; *pinnæ* two pair; *leaflets* from three to four pair, oblong, emarginate, glossy. *Spikes* panicled, lateral; *corollets* decandrous. *Legume* jointed, with an entire margin.

Mimo *Entada. Willd.* 4. 1041.

Acacia *scandens. Willd.* 4. 1057.

Perim-kaku-valli. *Rheed. Mal.* 8. *t.* 32. 33. *and* 34.

Entada. *Rheed. Mal.* 9. *t.* 77.

Beng. Gilla.

An immense scandent plant of many years duration; the oldest in the Botanic garden has been there fifteen years, and has not yet blossomed. Flowering time in the forests of Silhet
II. where it is common, March and April; the seed ripens toward the close of the year.
555 *Trunk* thick in proportion to the age and soil; in the above mentioned fifteen years old plant in the Botanic garden, it is twenty-four inches in circumference. *Bark* rough, olive grey, and like most of the genus, astringent. *Young shoots* remarkably long, smooth, slender, and shining, and while very young, furrowed. *Leaves* alternate, bipinnate; from six to twelve inches long. *Pinnæ* two pair. *Leaflets* three or four pair, oblong-emarginate, lucid, entire, from one to three inches long. *Petiole common*, ending in a two-cleft, powerful tendril; all are polished, without glands, but channelled. *Stipules* subulate, small, embracing the branchlet. *Spikes* generally from four to eight, on a common peduncle, from the axills of the former leaves, upon the two or three years old branchlets, and there is often more than one such peduncle in the same axill. *Rachis* and the minute bracte clothed with ferruginous pubescence. *Flowers* numerous, small, pale yellow. *Calyx* cup-shaped, five-toothed. *Corol* one-petalled, but divided to very near the base into five lanceolate segments. *Filaments* ten, inserted into the short tube of the corol. *Anthers* two-lobed, with a glandular point between them. *Germ* linear, containing many *ovula. Style* the length of the stamina. *Stigma* simple, but large. *Legumes* of an immense size, often several feet in length, and from four to five inches broad,

spirally twisted, surrounded with a thick very firm, polished, entire rim, which is found to remain, like a picture frame, when the less durable, jointed body of the legume has disappeared; *joints* from ten to thirty, one-seeded, ligneous, swelled in the centre where the seed is lodged, and more or less transversely furrowed, otherwise pretty smooth, and of a greenish ash colour when ripe. *Seeds* sub-ovate, nearly as large as a pullet's egg. *Integument* single, thick and hard, in fact a powerful, polished, shining, chesnut-coloured nut. *Perisperm* none. *Embryo* straight. *Cotyledons* equal, conform to the seed, amygdaline. *Radicle* patelliform, lodged at the umbilicus of the seed. Page Carey Ed.

SECT. III. Thorny. Spikes globular. II. 556

24. M. *dulcis. R. Corom. pl.* 1. *N.* 99.

Thorns stipulary. *Leaves* bipinnate; *leaflets* subsemielliptic. *Panicles* terminal; *spikes* round, subsessile; *corollets* monodelphous. *Legumes* twisted, turgid, with sweet, firm pulp, and smooth black seeds.

Inga dulcis. Willd. 4. *p.* 1005.

A native of the Philippine Islands. It flowers during the cold season in India, where it grows quickly to be a large beautiful tree, yielding annually abundance of nourishing, edible fruit. The timber is also of a good quality.

25. M. *concordiana. R.*

Arboreous. *Thorns* stipulary. *Leaves* bipinnate; *pinnæ* one or two pair; *leaflets* from three to seven pairs. *Spikes* globular; *corollets* pedicelled, monodelphous. *Legumes* curved, many-jointed, notched on the exterior margin.

A low tree. *Trunk* short, a few feet only, thickness various. *Bark* light ash colour, and scabrous.

Branches numerous, forming a very large spreading head, which is out of all proportion to the trunk; *branchlets* flexuose. *Thorns* often solitary, large, diverging; leaf-and flower-bearing they then appear as small branchlets, with sharp points; from one line to three inches long. *Leaves* bipinnate; on the young shoots, alternate, on the older parts collected. *Pinnæ* one or two pair, from one to three inches long. *Leaflets* from three to ten pairs, opposite, sessile, linear-oblong, smooth, entire, the exterior largest, and obliquely obovate-oblong, from six to twelve lines long, and about the same breadth. *Petioles common,* short, downy, with an umbilicated gland between each pair of pinnæ, and a short point at the apex. *Peduncles* one or two, axillary, about two inches long, each supporting a globular head of a few, white, subpedicelled corollets. *Calyx* and *coral* five-parted. *Filaments* numerous, monodelphous. *Legume* large, articulate, compressed, much curved, often forming a circle, or more, as in M. *dulcis*, hard, dark brown or blackish, a little scabrous. *Seeds* round, compressed, smooth, brown. II. 557

Note. It ought to be compared with Vahl's M. *nitida.* I think his description agrees tolerably well with this plant, except in the stamina, his being polyandrous, mine most perfectly monodelphous, but if Willdenow is correct in his definition of the *legume* in his genus *Acacia*, this plant, which has a most perfectly articulate legume, cannot be his *Acacia nitida. ed. sp.* 4. 1086. the only species observed by me, which it resembles. Vahl is silent about the legume.

26. M. *Farnesiana. Linn. Syst. Veg. ed.* 4. *p.* 916.

Shrubby. *Thorns* stipulary. *Leaves* bipinnate; *pinnæ* from four to five pairs: *leaflets* from ten to fifteen pairs. *Spikes* axillary, long-peduncled, round; *corollets* polyandrous. *Legumes* turgid, with two rows of seeds enclosed in pulp.

Acacia *farnesiana. Willd.* 4. *p.* 1083.

Teling. Kustoori, or Piktoomee.

Sans. Urimeda. Vitkhira.

Beng. Gooya-babula.

Sami. *Asiat. Res.* 4. *p.* 307, is this plant, though the specimens of the *Sami* tree sent to me by Capt. Wilford, belong to my *Adenanthera aculeata.* See *Prosopis aculeata. Asiat. Res.* 4. *p.* 405.

A native of every part of India. It flowers in the cold season.

27. M. *arabica. Lamarck. Encyclop.* 1. 19. *R. Corom. pl.* 2. *N.* 149. II. 558

Thorns stipulary. *Leaves* bipinnate; *pinnæ* five pairs; *leaflets* fifteen pairs. *Spikes* axillary, round; *corollets* polyandrous. *Legumes* pedicelled.

Burbura the Sanscrit name.

Acacia *arabica. Willd.* 4. *p.* 1085.

Teling. Nella-tooma.

Beng. Babool or babula.

Very common all over India, flowering and ripening its seed at various times of the year.

28. M. *eburnea. R. Corom. pl.* 2. *N.* 199.

Shrubby. *Thorns* stipulary, often longer than the leaves, and united at the base. *Leaves* bipinnate; *pinnæ* six pair; *leaflets* nine pair. *Spikes* axillary, round; *corollets* polyandrous. *Legumes* linear, and variously bent.

Acacia *eburnea. Willd.* 4. *p.* 1081.

A native of Coromandel, where it flowers during the cold season.

29. M. *leucophlea. R. Corom. pl.* 2. *N.* 150.

Thorns stipulary. *Leaves* bipinnate; *pinnæ* ten pair; *leaflets* twenty-five pair. *Panicles* terminal, spikes round; *corollets* polyandrous. *Legume,* long, linear, curved.

Teling. Tella-tooma.

Acacia *leucophlea. Willd.* 4. *p.* 1083.

Page Carey Ed. A native of Coromandel. It flowers during the rainy season.

30. M. *tomentosa. R.*

Arboreous; tender parts tomentose. *Thorns* stipulary. *Leaves* bipinnate; *pinnæ* from ten to twelve; *leaflets* twenty pair, downy. *Spikes* globular, peduncled, axillary, single or paired; *corollets* polyandrous. *Legume* compressed, falcate.

Acacia *tomentosa. Willd.* 4. 1089.

Beng. Sain babul.

II. 559 *Tam.* Kodi-velo.

This I have met with in Bengal, in the state of a small tree, but it appears as if it would be large if permitted to remain. Flowering time the beginning of the cold season; *young shoots* downy.

Thorns stipulary, straight, divaricate, about an inch long, very strong and sharp, when young downy. *leaves* bipinnate; *pinnæ* ten or twelve pair. *Leaflets* from fifteen to thirty pairs, very minute, downy. *Petioles* common and partial, downy, with an umbilicated gland or two between the last pair or two of pinnæ, and an oblong one below the lower pair. *Spikes* axillary, globular, white, peduncled, one, rarely two, together, small, rather offensive. *Peduncles* pretty long, and bracted at the middle. *Legume* linear, compressed, falcate; from six to eight-seeded.

SECT. IV. *Thorny. Spikes cylindric.*

31. M. *dumosa. R.*

Shrubby, very ramous. *Thorns* stipulary, somewhat recurved; *pinnæ* from two to four pairs; *leaflets* four or five pairs, oval, minute.

A small, very bushy tree, or large shrub of uncommon beauty, a native of the country immediately west of Delhi; its leaves are minute, and of a greyish colour.

32. M. *latronum. Linn. Suppl.* 4. 38.

Subarboreous. *Thorns* stipulary, united at the base, often dreadfully large. *Leaves* bipinnate, *pinnæ* four pair; *leaflets* about ten pair. *Spikes* axillary, peduncled, subcylindric; *corollets* polyandrous. *Legume* thin, broad-falcate, three or four-seeded.

Teling. Pukee-tooma.

Acacia *latronum. Willd.* 4. 1077.

II. 560 A native of the coast of Coromandel, where it blossoms about the beginning of the hot season. It is a small tree, or large ramous shrub, with numerous, interwoven, flexuose branches, covered with a dark brown bark, dotted with white.

Spines united at the base, often very large, round, tapering to an acute, hard, brown point, the rest white, and smooth, particularly when young. Inwardly hollow, and the habitation of ants. From the fork, where the two unite, often a small branchlet, or leaf issues. *Leaves* bipinnate, in the young growing shoots they are solitary, from the fork of the spines all over the older branches several are frequently found together. *Pinnæ* from three to five pair, opposite and rarely an inch long. *Leaflets* from ten to twelve pair, minute, smooth. *Petioles common*, acute, pointed, with a gland on the upper side a little below the first pair of pinnæ. *Stipules* no other than the spines. *Peduncles* generally in pairs, from the axills of the spines, and mixed with leaves, short. *Spikes* cylindric, about as long as the leaves. *Flowers* polyandrous, rather remote, fragrant, pure white when they first expand, but becoming yellow. *Calyx* minute, from four to five-toothed. *Corol* three or four times longer than the calyx, from four to five-cleft. *Stamens* numerous, distinct. *Germ* obliquely oval. *Style* crooked, as long as the stamens. *Legume* thin, broad-falcate, three or four-seeded.

33. M. *fera. Lour. Cochin Ch.* 801.

Thorns solitary, often much branched. *Leaves* bipinnate and pinnate; when bipinnate the *pinnæ* are from four to eight pairs; *leaflets* sub-alternate, from six to ten pairs. *Spikes* axillary, cylindric; *Corollets* with from five to ten stamina. *Legumes* long, linear, variously bent.

Gleditsia *horrida. Willd.* 4. 1098.

II. 561 A native of China and Cochin China; young trees reared in the Botanic garden at Calcutta, from seeds of *Gleditshia triacanthos* received from America, do not in any respect differ from our China plant, which is evidently a *Mimosa*, and most likely Loureior's *fera*. It is a tree of very slow growth, and the wood particularly hard. Trees in this garden about twenty-five years old are not above twenty-five feet high, with slender, crooked, poor-looking trunks.

34. M. *cinerea. R. Corom. pl.* 9. *N.* 174.

Subarboreous. *Thorns* solitary; *leaves* bipinnate; *pinnæ* from eight to nine pair; *leaflets* fifteen pairs. *Spikes* axillary, subcylindric; *corollets* decandrous, the lower ones sterile.

Desmanthus *cinereous. Willd.* 4. *p.* 1048.

Teling. or Yellow.

Tam. Warfataro.

A native of Coromandel. The spikes of this plant are large, droop much, and are particularly elegant.

SECT. V. *Prickly. Spikes cylindric.*

35. M. *obovata. R.*

Arboreous, armed with stipulary, recurved prickles. *Leaves* bipinnate; *pinnæ* about three pairs; *leaflets* about four pairs, obovate. *Spikes* cylindric, axillary. *Legumes* linear, oblong, leafy.

A native of Rohilcund, where it blossoms in March.

Page Carey Ed.

36. M. *ferruginea. R.*

Arboreous. *Prickles* stipulary. *Leaves* bipinnate; *pinnæ* from four to six pairs; *leaflets* from ten to twenty pairs. *Spikes* axillary, cylindric; *corollets* monadelphous. *Legumes* leafy, from five to six-seeded.

Teling. Woanee.

This species I cannot well reduce to any of those mentioned in the works of Linnæus. It is a native of the mountainous parts of the country, where it grows to be a pretty large tree. *Bark* deeply cracked, of a dark, rusty colour, and strongly astringent.

II. 562

Thorns stipulary, recurved, strong, short and very sharp, they are not always present. *Leaves* alternate, bipinnate, from two to three inches long. *Pinnæ* from three to six pair, opposite, one or one and a half inch long. *Leaflets* from eight to twelve pair, linear oblong, smooth, small. *Petioles* common, now and then armed with a few small prickles on the under side. *Peduncles* axillary, from one to three, and about the extremities of the branchlets, short, each ending in an erect, cylindrical spike of pale yellow corollets. *Filaments* many, conjoined into a tube near the base. *Legumes* membranaceous, rust-coloured, about six inches long, and one broad. *Seeds* from five to seven.

37. M. *catechuoides. R.*

Arboreous. *Bark* dark brown. *Prickles* stipulary. *Leaves* bipinnate; *pinnæ* from ten to fifteen pair; *leaflets* from thirty to forty pair. *Spikes* axillary, from one to three, cylindric; *corollets* monadelphous. *Legumes* linear, thin.

38. M. *Catechu. R. Corom. Pl. 2. N.* 174.

A mistake I was not aware of till I found the real M. *Catechu* in Bengal.

Teling. Podol Maun.

A pretty large tree, a native of Coromandel and Bengal.

39. M. *Sundra. R. Corom. pl.* 3. *No.* 225.

Arboreous. *Bark* dark brown. *Prickles* stipulary, recurved, with decurrent base. *Leaves* bipinnate; *pinnæ* fifteen pair; *leaflets* from twenty to forty pair. *Spikes* axillary, from one to two, cylindric; *corollets* monadelphous. *Legumes* lanceolate, thin, two or three-seeded.

Acacia *Chundra. Willd.* 4. *p.* 1079.

Teling. Sundra.

II. 563

A native of Coromandel. It flowers in July and August.

40. M. *Suma. R.*

Arboreous, with remarkably white bark, twigs villous. *Prickles* stipulary, broad-based, straight. *Leaves* bipinnate; *pinnæ* from ten to twenty pair; *leaflets* fifty pair. *Spikes* (from one to six) axillary, cylindric; *corollets* polyandrous. *Bractes* lanceolate. *Legume* linear, thin, from six to eight-seeded.

Acacia *polycantha. Willd.* 4. *p.* 1099.

Sans. Shumee.

Beng. Sai-kanta.

A very common tree about Calcutta, and over Bengal, and is remarkably conspicuous on account of its white bark. Flowering time the rainy season. There is a large concave gland above the base of the petiole, and two or three between the last two or three pairs of pinnæ.

41. M. *Catechu. Linn. suppl.* 439.

Arboreous. *Bark* dark brown, armed with most acute, stipulary, recurved aculei. *Leaves* bipinnate; *pinnæ* from ten to thirty pair; *leaflets* as far as fifty pair; *petioles* armed. *Spikes* axillary, cylindric. *Bractes* from lanceolate to triangular; *Corollets* polyandrous. *Legume* brittle, linear, thin, from six to eight-seeded.

Acacia *Catechu. Willd.* 4. *p.* 1079.

42. M. *Catechu. Medical observ. v.* 5. *p.* 151. *t.* 4.

Beng. Khira.

Khadira in Sanscrit and Kudhir the name of the extracts.

The last five species are nearly allied to each other, and require no small degree of attention to point out their differences in a short definition. Probably they are equally fit for yielding the extract now called Catechu. Flowering time the hot and rainy seasons. The seed ripens after the rains.

II. 564

SECT. VI. *Prickly. Spikes globular.*

43. M. *pudica. Willd.* 4. 10. 31.

Perennial, diffuse, aculeate. *Leaves* digitate, pinnate; *pinnæ* about four; *leaflets* many; *corollets* pentandrous.

Beng. Lajuk.

Native place uncertain, but common in gardens throughout India.

44. M. *mutabilis. R.*

Shrubby, scandent, armed with remote recurved prickles. *Leaves* bipinnate; *pinnæ* four pair; *leaflets* four or eight pairs. *Spikes* panicled, round; *corollets* [illegible]. *Legume* curved, three jointed, with a prickly margin.

A native of the banks of the Ganges near Benares, and particularly conspicuous on account of its numerous flowers, which appear during the rains; they are of a bright lively purple when they first expand, but become white by age, the reverse of the greater part of our Indian changeable flowers which generally acquire colour by age.

45. M. *octandra. R. Corom. pl.* 2. *No.* 200.

Page Carey Ed.

Shrubby, scandent, prickles scattered. *Leaves* bipinnate; *pinnæ* from three to six pair; *leaflets* eight pair. *Spikes* panicled round; *corollets* octandrous.

Teling. Wallag-doora, or Poota; with prickly, jointed margins, Korinta.

M. *rubicaulis. Willd.* 4. *p.* 1038.

Beng. Shai-kanta.

A native of the warmer parts of Asia, and like the last blossoming in the rains, and the flowers changing their colour in the same manner; I doubt if they are sufficiently removed from each other to make distinct species.

II. 565

46. M. *Intsia. sp. pl.* 1508.

Shrubby, scandent, prickles scattered. *Leaves* bipinnate; *pinnæ* four or five pair; *leaflets* about nine pair, shining, glands, one near the base of the petiole, and an obconical one between each pair of pinnæ. *Stipules* narrow, cordate. *Spikes* panicled, round; *corollets* polyandrous. *Legumes* leafy, linear.

Teling. Korinta.

Intsia. Rheed. Hort. Mal. 6. *t.* 4.

Acacia Intsia. Willd. 4. *p.* 1091.

A large rambling plant, common in forests all over Coromandel.

47. M. *concina. Willd.* 4. *p.* 1039.

Subarboreous, climbing, prickles numerous. *Leaves* bipinnate; *pinnæ* from four to eight pair; *leaflets* from ten to twenty pair. *Stipules* and *bractes* obliquely semicordate. *Spikes* axillary, crowded, round; *corollets* polyandrous. *Legumes* fleshy, scarcely jointed.

Teling. Chicaee.

Beng. Bun-reetha.

A considerable trade is carried on, in some parts of India, with the saponaceous legumes of this species. The plant is common in most forests, and blossoms during the rains in Bengal.

48. M. *cæsia. sp. pl.* 1507.

Shrubby, scandent, armed with numerous recurved prickles. *Leaves* bipinnate; *pinnæ* about eight pair; *corollets* polyandrous. *Legumes* leafy, linear.

Acacia *cæsia. Willd.* 4. *p.* 1090.

Teling. Konda Korinta.

A native of Coromandel.

II. 566

49. M. *pennata. sp. pl.* 1507.

Arboreous, with long scandent branches, armed with recurved aculei, none of which are stipulary. *Leaves* bipinnate; *pinnæ* from twelve to fourteen pair; *leaflets* about forty pairs. *Panicles* terminal; *spikes* globular, *corollet* polyandrous.

Hind. Biswool.

Acacia *pennata. Willd.* 4. *p.* 1090.

Acacia *aculeata. Burm. Zeyl.* 2. 11.

A native of Hindoostan of the Ballo and Payen Ghaut mountains. Flowering time the month of October; the seed ripens in March and April.

50. M. *torta. R.*

Sub-arboreous, with scandent branches, armed with recurved prickles. *Leaves* bipinnate; *pinnæ* as many as thirteen pair; *leaflets* as many as forty pair; *petioles* with a large oblique conic gland at the base, and between each of the last half of the pinnæ. *Racemes* terminal; *spikes* globular, *corollets* polyandrous. *Legumes* leafy, from six to ten-seeded.

A native of the mountains of Coromandel. In those prickly, scandent, species, the small lateral branchlets twist round whatever they meet with and give powerful support to the whole plant, after having taken a turn or two their length extends, &c. like the other branches.

CAPPARIS. Schreb. gen. n. 876.

Gen. char. *Calyx* four-leaved. *Corol* four-petalled. *Stamina* long. *Germ* pedicelled, one-celled; *ovula* numerous, attachment parietal. *Berry* pedicelled, one-celled, many-seeded. *Embryo* spiral, no perisperm.

1. C. *acuminata. Willd.* 2. 1131.

Shrubby, armed with stipulary, straight thorns. *Leaves* from broad-lanceolate to cordate-acuminate, smooth; *peduncles* solitary, one-flowered. *Berries* obovate.

II. 567

Beng. Kaloo-kera.

Teling. Palikee.

A middle sized, or rather a low, scraggy, ramous shrub, growing common on dry, barren, rocky, or stony ground. It flowers about the end of the cold season.

Young shoots of a bluish purple colour, and covered with a little white dust. *Thorns* stipulary, straight, short. *Leaves* alternate, short-petioled, from broad-lanceolate to oval, firm, smooth; *margins* somewhat scabrous, and for the most part ending in a small, hard, sharp point; about two inches long, and one and a half broad. *Peduncles* axillary, solitary, one-flowered, nearly as long as the leaves. *Flowers* pretty large, the two upper petals tinged yellow. *Anthers* blue. *Germ* long-peduncled, oblong, hairy, one-celled with four partitions projecting from the opposite sides of the walls to near the centre, but not meeting. *Ovula* numerous, attached in two vertical rows to each angle formed by the partial partitions and the seeds on the germ. *Berry* sub-rotund, size of a pigeon's egg, pretty smooth, soft, and when ripe red, one-celled. *Seeds* many, scattered in soft fœtid white pulp, beaked, reniform. *Integuments* four: the *exterior* one ash-coloured and membranaceous; the *second*, thick, brown, tolerably

hard, two-valved; the *third*, a thin white membrane lining the second, or shell; and the *fourth*, membranaceous and attached to the seed. *Perisperm* no other than the fourth or inner integument of the seed. *Embryo* spirally rolled up. *Cotyledons* two-folded, petioled, ovate, veined. *Radicle* three or four times larger than the cotyledons, spirally rolled up with its thick point to the umbilicus. Page Carey Ed.

2. C. *Zeylanica. Willd.* 2. *p.* 1132.

Shrubby, climbing; *young shoots* ferruginous, armed with stipulary recurved thorns. *Leaves* long, oval, acuminate. *Peduncles* one, two, or three, above the axills, one-flowered. *Petals* ciliate, shorter than the stamina; *berries* obovate obtusely four-sided. II. 568

Teling. Adonda.

This species is readily known, by the tender shoots, leaves, and calyces being covered with much rust-coloured pubescence, by there being often three flowers in the axill, and by the petals being much shorter than the stamina, and ciliate, and lastly by the germ being nearly round.

3. C. *subspinosa. R.*

Scandent, armed with minute, stipulary thorns. *Leaves* linear-oblong, acute. *Racemes* corymbiform, axillary, and terminal; the whole forming a leafy panicle. *Corols* almost regular.

A native of the Moluccas.

4. C. *sepiaria. Willd.* 2. 1132.

Shrubby; *stipules* thorny. *Leaves* oval. *Umbels* terminal. *Corols* irregular. *Berries* one-seeded.

Beng. Kanta-goor-kamaee.

Teling. Nella puee.

A middle sized very ramous, strong shrub, common in hedges, for which it is a most excellent plant.

Trunk scarcely any. *Branches* numerous, winding, very stiff. *Prickles* stipulary, recurved, very strong and sharp. *Leaves* alternate, short-petioled, oval, emarginate, smooth; about one inch and a quarter long and three quarters of an inch broad. *Umbellets* simple, terminal, globular, many-, and one-flowered. *Flowers* small white. *Calyx* unequal. *Petioles* unequal, ascending on one side. *Filaments* ascending on the other. *Berry* the size of a small cherry, smooth, black, one-seeded.

5. C. *bisperma. R.* II.

Arboreous; *stipules* thorny, recurved. *Leaves* oval, obtuse. *Racemes* terminal, corymbed. *Corols* irregular. *Berries* globular, two-seeded. 569

Teling. Goolee.

A timber tree, a native of the extensive forests amongst the mountains.

Trunk thick, tolerably erect, but of no great height. *Branches* numerous, spreading in every direction. *Thorns* stipulary, recurved, small, frequently wanting. *Leaves* alternate, short-petioled, oval, obtuse or slightly emarginate, smooth; about two inches long, and one and a half broad. *Racemes* terminal, corymbiform. *Calyx* four-leaved, unequal. *Petals* four, oblong, waved, unequal, ascending, placed on the upper side, inserted into the insterstices of the calyx by short claws. *Filaments* numerous, ascending on the under side opposite to the petals. *Berry* the size of a nutmeg. *Seeds* two, kidney-formed.

Note. This differs from C. *Grandis* of Dr. König in having thorns, and obtuse, or emarginate leaves. Can soil and situation cause the difference?

The wood is heavy, hard and durable, the natives employ it for various uses.

6. C. *corymbosa. R.*

Shrubby, climbing, armed with stipulary, recurved prickles. *Leaves* long, obovate; *corymbs* terminal. *Corol* irregular. *Berries* globular.

Teling. Aguba.

A large climbing shrub, a native of hedges and forests.

Branches twiggy. *Prickles* stipulary, recurved. *Leaves* alternate, remote, short-petioled, oblong-ovate, obtuse, smooth, shining, entire, about two inches long and one broad. *Racemes* corymbiform, terminal. *Flowers* large, very beautiful, white, slightly tinged with yellow. *Fruit* the size of a pullet's egg, globular, smooth, when ripe of a beautiful dark purple. II.

7. C. *heteroclita. R.* 570

Shrubby, climbing, unarmed. *Leaves* elliptic; *Corymbs* terminal. *Calyx* four-cleft. *Corol* regular. *Stamina* on the receptacles. *Berries* long, compound.

Teling. Putta tiga.

A large unarmed climbing shrub, a native of the most unfrequented and inaccessible woody parts of the Circar mountains. It flowers during the cold season.

Trunk and *branches* climbing. *Bark* of the old ligneous parts brown, and rough; of the young, round shoots, smooth and green. *Leaves* alternate, petioled, oval, entire, smooth on both sides; from one to two inches long; and from half an inch to an inch broad. *Flowers* pretty large, pale greenish white, terminal, forming small corymbs, of from four to eight on pretty long round, smooth peduncles. *Bractes* minute, one under the base of each peduncle. *Calyx* one-leaved. *Tube* short, campanulate, four sided. *Border* four-parted; *divisions* broad-lanceolate, acute, entire, smooth. *Corol* four-petalled. *Petals* inserted into the calyx over the fissures, equal, lanceolate, waved, acute, about half the length of the calyx. *Filaments* many, longer than the calyx, inserted on a clavate receptacle, which is as long as the tube of the calyx. *Anthers* oval. *Germ* elevated on a long, slender style-like pedicel, even with the anthers, oblong, two-celled, each containing two vertical rows of ovula, attached to the partition. In what I consider the real species of *Capparis*, the receptacles are *parietal*, here septal. *Style* none. *Stigma* large, rather rough, and convex. *Pericarp* a long, compound, pendulous, berry,

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or rather four rows of berries, affixed along a receptacle: the whole is from two to five inches long, singly they are about the size of a cherry, covered with a thin, dry bark. *Seeds* only one in each single berry, or lobe of the compound fruit.

Note. I should imagine this, with several of Jacquin's species, will form a new genus, the short turbinate receptacle is exactly like that of *Grewia.*

The unripe fruits are boiled, and eaten by the natives.

8. C. *trifoliata. R.*

Arboreous, unarmed. *Leaves* terminal. *Corol* irregular. *Berry* spherical.

Crateva religiosa. Willd. 2. 853.

Nurvala. Rheed. Mal. 3. *t.* 42.

Sans. Vuroona, also Tikta-shaka.

Beng. Buroon.

Teling. Tella woollee mera.

Common every where throughout India, it flowers about the beginning of the hot season.

PAPAVER.

Calyx, two-leaved. *Corol* four-petalled. *Capsule* superior, one-celled, crowned by the permanent, dehiscent stigma.

P. *somniferum. Willd.* 2. 1147.

Calyx and *capsule* smooth. *Leaves* stem-clasping, garbed.

Beng. Post; and Afin, the opium.

Pers. Kooknar.

Arab. Khus kash.

The large single, white flowered variety, with white seed, is extensively cultivated in many parts of India.

ARGEMONE.

Calyx three-leaved. *Corol* six-petalled. *Capsule* unilocular, opening at the apex; *receptacle* parietal. *Seeds* many.

II. 572

A. *mexicana. Willd.* 2. 1148.

Annual. *Leaves* stem-clasping, spinous. *Capsule* five-valved.

Beng. Bura sheal kanta.

A common weed by road sides, &c. throughout India; it blossoms and ripens its seed during the dry season.

GORDONIA. Schreb. gen. n. 1144.

Gen. Char. *Calyx* five-leaved, or five-cleft. *Petals* five, inserted on the base of the united filaments. *Germ* superior, five-celled; *cells* from two to three-seeded; *attachment* interior. *Capsules* superior, five-celled. *Seeds* winged. *Embryo* inferior, centripetal, with scanty perisperm.

Note. Notwithstanding the union of the ring formed by the filaments, and the *malvaceous* structure of the seed vessel and seed, I am for the present induced to place this genus in the class *Polyandria.*

1. G. *integrifolia. R.*

Arboreous. *Leaves* broad-lanceolar, entire, acuminate. *Pedunclès* axillary, solitary, one, two, or three-flowered. *Capsules* spherical.

Hind. Makrisal.

A large timber tree, a native of the hilly tracts on the eastern frontier of Bengal, where it flowers in April and the seed ripens in December.

2. G. *oblata. R.*

Arboreous. *Leaves* broad-lanceolar, serrate, acute, coriaceous. *Peduncles* axillary, solitary, long, one-flowered. *Capsules* oblate spheriodical, with two or more seeds in each cell.

II. 573

A tree, a native of Pulo Penang, where it was discovered by Dr. William Hunter.

3. G. *decandra. R.*

Leaves oval, entire; *corymbs* axillary, three or four times dichotomous. *Flowers* decandrous. A native of Pulo Penang, where it blossoms in May.

Leaves alternate, petioled, oval, smooth, entire, emarginate, of a firm texture, almost coriaceous, about three inches long and two broad. *Petioles* short, channelled. *Stipules* none. *Corymbs* axillary, as long as the leaves, three or four times dichotomous. *Flowers* numerous, small. *Calyx* five-leaved, leaflets imbricated, ovate, concave, permanent. *Petals* five, obovate, scarcely longer than the calyx, and like it permanent. *Filaments* ten, five or six times longer than the corol, united near the base only, forming a cup round half of the germ, with the pollen round the margin. *Germ* superior, ovate. *Style* as long as the stamens. *Stigma* large, subpeltate. *Capsule* oblong, of the size of the second point of a man's forefinger, five-celled, five-valved. Each valve has a deep, sharp, longitudinal keel on the inside, half dividing the cells, which are separated by a continuation of the inflected margins of the valves, which unite in the centre and form the receptacle of the seed. *Seeds* two in each cell, separated by the keels of the valves, ending above in a long superior wing, and inserted near its apex into the inner margin of the partitions.

ANNESLEA. R.

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GEN. CHAR. *Calyx*, four-leaved. *Corol* many-petalled. *Style* none. *Stigma* concave, peltate, with about six rays. *Germ* inferior, from six to eight-celled; *cells* five-seeded. *Berry* many-seeded. *Seeds* arilled. *Embryo* dicotyledonous, and furnished with both perisperm and vitellus, direction various.

A. *spinosa. R.*

A native of the sweet-water lakes and ponds in the district of Tippera, Chittagong, &c. to the eastward of Calcutta, where it blossoms most part of the year, and is known to the natives of those countries by the name Makana. II. 574

Root, consists of numerous, thick, fleshy fibres, which descend deep into the soil at the bottom of the water the plant grows in. *Stem* none. *Leaves* radical, with petioles sufficiently long to admit of their floating on the surface of the water, peltate, from orbicular to oval, entire, having the upper surface dark green, with ferruginous veins, and armed with a few very slender prickles, of a most beautiful purple, underneath and there reticulated with numerous, very large, prominent, dichotomous, finally anastamosing veins, armed with long, straight, very sharp, strong spines; size of the leaf from one to four feet each way. *Petioles* round, and armed with straight spines. *Peduncles* radical, one flowered, round, armed with straight spines; if the water is shallow they are generally so long as to elevate the flower above its surface; but if deep, they blossom under water. *Flowers* small for the size of the plant, colour a lovely blue-violet. *Calyx* four-leaved, inserted on the crown of the germ, armed on the outside with recurved spines, smooth and coloured on the inside. *Corol*, petals about twenty, narrow, ovate-oblong; the exterior ones nearly as large as the *calyx*, gradually lessening till they become very small, and nearly colourless next to the stamina. *Filaments* numerous, and like the petals, lessening towards the centre. *Anthers* oval. *Germ* beneath, ovate, armed, from six to eight-celled, each containing from six to ten seeds attached to the partitions, and to the exterior angles of the cells as in *nymphaea*. *Style* none. *Stigma* cup-shaped, with the margin only slightly marked with six, seven, or eight elevations. *Berry* inferior, nearly round, size of an orange, swelling out in various places by the growth of the seeds within, crowned with some portion of the *calyx* and the rays of the sessile peltate stigma which are from six to eight. II. *Cells* obscure, as the partitions become obliterated in the ripe state. *Integuments*, or bark, 575 fleshy, armed with straight, sharp spines not opening into any number of valves, but, as in *Nymphaea* putrifying or crumbling away. *Seeds* nuciform, about twenty, nearly round, each enveloped in a complete, fleshy rose-coloured aril. *Integuments* two, the exterior one or shell nuciform, dark brown, uneven, with a very conspicuous pit near the oblong umbilicus which covers the vitellus; the inner one thin, and light brown. *Perisperm* conform to the seed, of a pure white, amygdaline consistence. *Vitellus* leuticular, penetrating the perisperm about one fourth its diameter, enveloped in its proper thin white integument, which adheres more firmly to the perisperm than to this organ. *Embryo* lodged in the exterior half of the vitellus, and attached to its exterior, elevated point, or dome, oval, with the inner end divided into two equal lobes. The part between these lobes and the apex, or exterior end, which is united to the point of the vitellus, I call the peduncle of the embryo, which lengthens as germination proceeds, and first forces the exterior end, or dome of the vitellus, through the pit in the shell, already mentioned, and there taking a square from, the corners thereof become ragged and blackish. The sheath or thickened integument of the vitellus, which connects this part, lengthens also, and opens in one side to give passage to the two lobes of the embryo; the peduncle continues lengthening, and when from half an inch to an inch in length, the two lobes, now evidently the two *cotyledons*, begin to separate. The exterior one, and yet the largest, takes a simple subulate shape; and the inner, or smaller lobe now advances fast, soon becoming not only the largest, but long-peduncled, and trifid; from the bosom of these the *plumula* advances, and from the base of the petioles of the leaves thereof, and that of the trifid cotyledon the real roots issue, and give sustenance to the little, now independent plant. II.

The seeds are farinaceous, much liked by the natives, and sold in the public bazars to 576 the eastward of the mouths of the Ganges, where the plant is indigenous. The method of preparation, to fit them for the table is as follows; a quantity of sand is put into an earthen vessel, placed over a gentle fire, in the sand they put a quantity of the seed, agitate the vessel, or the sand with an iron ladle, the seed swells to more than double its original size, until it becomes light, white and spongy; during the operation the hard husk of the seed breaks in various parts, and then readily separates by rubbing between two boards, or striking it gently with a bye board. The Hindoo physicians consider these seeds to be possessed of powerful medical virtues, such as restraining seminal gleets, invigorating the system, &c. &c.

NYMPHAEA. Schreb. gen. n. 886.

Calyx and *corol* many-petalled. *Germ* inferior, many-celled, *cells* many-seeded; *attachment* septal. *Berry* many-celled. *Seeds* numerous. *Embryo* furnished with a perisperm; direction various.

1. *N. rubra. R.*

Leaves sub-orbicular, margins sharply sinuate-toothed, downy underneath. *Flowers red. Stamina* from forty to fifty. *Berries* spherical, from ten to twenty-celled.

Teling. Yerra-kalwa.

Sans. Hulluka, and Rukta Sundhyuka. See *Asiat. Res. vol. 4. p. 285.*

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Hind. Rukta chunduna, or Sundhuka.

Beng. Rukta kumbula.

A native of India. It flowers during the rainy season. In Bengal there is a small rose-
II. coloured variety with from twenty to twenty-five stamina, and from twelve to fifteen rays
577 in the stigma, consequently the same number of cells in the capsule. In all other respects they agree. It is by no means so common as *Lotus* but infinitely more gaudy.

2. N. *Lotus. Willd.* 2. 1153.

Leaves orbicularly-peltate, margins sharply sinuate-toothed, downy underneath. *Flowers* white. *Berries* about twenty-celled.

Teling. Tella-kalwa.

Ambel. *Rheed. Mal.* 11. *t.* 26.

Hind. Koee.

Sans. Koomooda.

Beng. Shalook.

It differs from N. *rubra* in the colour of the flowers only. There is a beautiful rare variety with pink-coloured flowers. The white sort is found common in pools, &c. of fresh water in every part of India; it blossoms more or less the whole year, but chiefly during the rains.

3. N. *versicolor. R.*

Leaves oval, peltate, repand-dentate, posterior having the sinus narrow wedge-shaped. *Segments* of the ray of the stigma, fifteen, long, incurred. *Berries* fifteen-celled.

A native of Bengal, where there are two varieties of it; one pure white, the other pink of various shades. Flowering time the rainy season.

4. N. *cyanea. R.*

Leaves roundish, peltate, obtuse, margins waved or even, both sides smooth, posterior lobes overlapping each other. *Flowers* azure; apices of the anthers foliaceous. *Berries* spherical, ten or twelve-seeded.

Sans. Kahlara.

Beng. Soondi; also Neel-pudma.

Teling. Neeti-kalwa.

II. It is a native of similar places with the last two.

578 *Root* the same as in *rubra* and *Lotus*. *Leaves* somewhat peltate, as in *N. rubra*, and *Lotus*, broad-cordate, lobes large and overlapping each other in Bengal; on the coast they are less luxuriant, and often divaricate, with the apex rounded, and the border sometimes waved, of a pale green on the upper side and a deep purple on the under side; both sides smooth. *Flowers* pale blue, considerably smaller than either of the former species. *Petals* from eight to twelve, lanceolate. *Filaments* about twenty-five, in a double series; many of the exterior series having their summits subulate and coloured like the petals. *Rays* of the stigma ten or twelve, very short. *Berry* about half the size of that of the two first species, nearly globular, ten or twelve-celled.

The roots and seeds of this species are also eaten by the natives, but less esteemed than those of the former.

5. N. *esculenta. R.*

Leaves sub-peltate, entire, downy underneath; *flowers* white. *Berries* from ten to fifteen-celled.

Koteka is the Telinga name of the plant, and Koteka-dumpa the tuberous root.

Beng. Chota Soondi.

Like the other species it grows in sweet, standing waters. It flowers during the wet and cold seasons. This species is considerably smaller than any of the others, even than *cyanea*.

Root perennial, tuberous, &c. like the rest. *Leaves* in shape, colour, substance, and down like those of N. *Lotus*, but the margin is always entire, or most slightly waved, whereas in Lotus it is always scallop-toothed, and as the size according to the rules of Linnæus, cannot be admitted as a specific mark, the difference in the margin is alone to be observed. *Flowers* white, and smaller than those of *cyanea*. *Petals* from ten to fifteen, inserted as in the other
II. species. *Stamens* about thirty, in a double series. *Stigma*, its rays are in number from ten to
579 fifteen, long, and incurved. *Berry* spherical, of the size of a large nutmeg, from ten to fifteen-celled.

The tuberous roots of this sort, are reckoned by the natives far superior to those of any of the former three.

6. N. *stellata. Willd. Bot. Repos. N.* 330.

Leaves oval, entire, smooth on both sides. *Flowers* blue. *Calyx* four-leaved. *Corol* eight petalled. *Stigma* eight-rayed. *Stamina* from fifteen to twenty; *apices* of the anthers foliaceous.

Beng. Chhoto Shalk.

Cit-ambel. *Rheed. Mal.* 11. *t.* 27.

A native of Bengal, and the smallest Indian species of this genus which I have yet met with.

AEGLE. Corr.

Calyx four or five-toothed. *Corol* four or five-petalled. *Germ* superior, from eight to twelve-celled; *cells* many seeded; *attachment* interior. *Berry* nearly round, covered with a hard cortex, from ten to fifteen celled. *Seeds* several in each cell. *Embryo* centripetal, no perisperm.

A. *Marmelos. Corom. pl.* 2. *N.* 143. *Corr. in act. Soc. Linn.* 5. 222.

Bilva, or Mabua. *Asiat. Res.* 2. *p.* 349. Page Carey Ed.
Beng. Bela.
Covalum. *Rheed. Mal.* 3. *t.* 37.
Bilacus. *Rumph. Amb.* 1. *t.* 81.
Crataeva *Marmelos. Willd.* 2. 853.
Teling. Maredoo.
Tam. Willa-marvum.

Grows to be a pretty large tree. Is a native of the mountainous parts of the coast of Coromandel; is also found sparingly, in the low lands. It flowers during the hot season, and the fruit ripens after the rains. *Trunk pretty* erect. *Bark* ash-coloured. *Branches* few and irregular. *Thorns*, axillary, in pairs, single, or none, very sharp, and strong. *Leaves* ternate. *Leaflets* oblong, or broad-lanceolate, attenuated to a bent point, crenulate, differing much in size, but the exterior one is always the largest. *Panicles* small, terminal, and axillary, flowers large and white, all hermaphrodite, at least, I have not found any other. *Calyx* four or five-toothed. *Corol* from four to five-petalled. *Filaments* about forty, short. *Anthers* linear, erect. *Berry* large, sub-spherical, smooth, with a hard shell, from ten to fifteen-celled; the cells contain, besides the seeds, a large quantity of an exceeding tenacious, transparent gluten, which on drying becomes very hard, but continues transparent; when fresh it may be drawn out into threads of one or two yards in length, and so fine as to be scarcely perceptible to the naked eye, before it breaks. *Seeds* from six to ten in each cell, oblong, a little compressed, woolly, attached to the inner angle of their cell. II. 580

This is the *Bilva* or Matura of the *Asiat. Res. vol.* 2. *page* 349, from whence the following is an extract. "Uses. The fruit is nutritious, warm, cathartic; in taste delicious, in fragrance exquisite; its aperient, and detersive quality, and its efficacy in removing habitual costiveness, have been proved by constant experience. The *mucus* of the seed is for some purposes a very good cement." Note "This fruit is called *Shreephula*, because it sprang, say the Indian poets from the milk of Shree, the goddess of abundance, who bestowed it on mankind at the request of Jowarra, whence he alone wears a chaplet of Bilva flowers, to him only the Hindoos offer them; and when they see any of them fallen on the ground, they take them up with reverence, and carry them to his temple."

The root, bark, leaves, and flowers are reckoned refrigerants by the Malabar physicians. The ripe fruit they esteem most wholesome. II.

In Bengal there is a small variety, which the natives call Shreephu*la* and is I presume that just mentioned by Sir. W. Jones. 581

BIXA. Schreb. gen. n. 887.

Calyx five-toothed. *Corol* ten-petalled. *Capsule* superior, bispid, two-valved.

B. *Orellana. Willd.* 2. 1854.
Can. Kuppa-manhala.
Hind. and *Beng.* Latkan.
Pigmentaria *Rumph. Amb.* 2. *t.* 19.

This small tree appears to be a native of India. The flowers are however white, and the immature *capsule* green. In plants reared from West India seed the flowers are rose-coloured, and the immature seed vessel red, nor do the seeds of our plant furnish so much, nor so good a colour.

CORCHORUS. Schreb. gen. n. 917.

Calyx five-leaved. *Corol* five-petalled. *Nectary* cup-shaped, between the corol and stamina. *Capsule* superior, from three to five-celled, three to five-valved.

1. C. *olitorius. Willd.* 2. 1214.

Annual. *Capsules* cylindrical, five-celled, with transverse partitions between the seeds.
Sans. Putta.
Beng. Pat.

A native of various parts of India. It is much cultivated in Bengal during the rains, for the fibres of its bark, which the Bengalees call jute, and employ for a variety of purposes. Of this there is a reddish variety which the natives call *Bun*, or wild *Pat.*

2. C. *capsularis. Willd.* 2. 1216.

Annual. *Capsules* globular, five-celled, without transverse partitions. II.
Ganja sativa. *Rumph. Amb.* 5. *t.* 78. *f.* 2. 582
Beng. Ghinalta pat.

Cultivated in Bengal and China during the rains for the fibres of its bark, of which gunny, or rice bags, &c. are made in Bengal.

3. C. *fuscus. R.*

Annual. *Leaves* ovate-oblong. *Stamina* from ten to fifteen. *(Style* single.*) Capsules* subcylindrical, six-angled, three-pointed, three-celled, with one row of seeds in each.
Beng. Titta pat.

A native of various parts of India. It flowers during the rainy and cold season. This species is never cultivated. It differs from *tridens*, in having only one style; and from *trilocularis*, in having only one row of seeds in each cell.

4. C. *fascicularis. Willd.* 2. 1216.

Annual, erect, ramous. *Leaves* lanceolate, serrate. *Flowers* in laterifolius, subsessile fascicles, sub-pentandrous. *Capsules* cylindric, three-celled.

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A native of Bengal, appearing and flowering during the rains; the seed ripens in the cool season.

5. C. *trilocularis. Willd.* 2. 1215.

Annual, erect. *Leaves* lanceolate, serrate, the lower serratures with or without a bristle. *Stipules* ensiform. *Flowers* paired, peduncled, and pedicelled. *Capsules* filiform, three-celled, hispid; *apex* entire and obtuse.

A native of Bengal. It flowers about the end of the rains; the seed ripens in the cold season.

6. C. *decemangularis. R.*

Annual, erect. *Leaves* elliptically oblong, obtusely serrate, lower serratures with or without a bristle.

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Stipules ensiform. *Flowers* paired, subsessile. *Capsules* cylindric, ten-ribbed, five-celled; *seeds* imperfectly separated.

A native of Bengal. Flowering time the end of the rains; the seed ripens in the cold season.

GREWIA. Schreb. gen. n. 896.

Calyx five-leaved. *Corol* five-petalled. *Nectary* a scale, or fringed gland on the inside of the base of each petal. *Stamina* and *germ* elevated on a receptacle. *Germ* superior, generally two-celled; *cells* few-seeded; *attachment* interior. *Drupe* with from one to four, one or more-seeded nuts. *Embryo* inferior, centripetal, and furnished with a perisperm.

8. G. *oppositifolia. Buch.*

Arboreous. *Leaves* rhomb ovate; gland-serrate, scabrous. *Peduncles* leaf opposed, from three to five-flowered. *Petals* lanceolate. *Drupe* from one to four-lobed; *nuts* one-celled.

A native of Nepal, from thence Dr. Buchanan sent seeds to the Botanic garden at Calcutta in 1802, and in March April, May, and June 1808, the young trees were in flower, and ripened their seed in October and November.

Trunk distinct, erect, stout as a man's arm. *Bark* pretty smooth, light ash colour. *Branches* spreading much, and covered with bark like the trunk. *Branchlets* or *young shoots* bifarious, round, harsh with stellate pubescence, and very short hairs. *Leaves* bifarious, alternate, short-petioled, from ovate, to rhomb-shaped, three-nerved, serrate, with the serratures obtuse and glandular, of an obscure green, and rather harsh on both sides, from two to three

II. 584

inches long, and one and a half broad. *Stipules* ensiform, hairy. *Peduncles* opposite to the leaves, solitary, much longer than the petioles, round, harsh, from three to five-flowered. *Pedicels* clavate, shorter than the peduncles. *Flowers* pretty large, yellowish. *Bractes*, or involucres several, round the insertion of the pedicels, ensiform, caducous. *Calyx*, the five leaflets linear, three-ribbed on the back. *Petals* lanceolate, with apices acute, but often somewhat serrate-dentate. *Nectarial* glands round, and ciliate. *Germ* ovate, hairy, two-celled, with two ovula in each, attached to the partitions. *Style* the length of the numerous stamina. *Stigma* of two, spreading green lobes with ragged edges. *Drupe* from one to four-lobed, one is most common, and the abortive ones appear attached to its base on one side, smooth, of an olive colour, fleshy; *flesh* a dull purple. *Nuts* one in each lobe of the drupe, obovate, thick, and very hard, one-celled. *Perisperm* conform to the nut. *Embryo* straight, nearly as long as the perisperm, green. *Cotyledons* cordate. *Radicle* ovate, inferior.

It is allied to G. *orientalis*, but the difference is sufficiently marked by the shape of the leaves, and their glandular serratures in this, independent of its being a tree, and the other always a shrub, and scandent when protected and supported; add also the smooth drupe with one-celled nuts.

2. G. *scabrophylla. R.*

Shrubby. *Leaves* round-cordate, serrate, rugose, above scabrous, underneath downy. *Peduncles* axillary, two or three-flowered. *Drupes* round; *nuts* four, one-celled, one-seeded.

A native of the upper parts of India, and reared in the Botanic garden at Calcutta from seed received from Captain Hardwicke, in 1803. Flowering time the hot season in April, the seed ripens in October.

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Stem or primary branches several, erect, round. *Bark* of a dark brownish green, and somewhat scabrous. *Branchlets* few, and erect. *Young shoots* hirsute. The whole plant about three, or four feet high. *Leaves* alternate, short-petioled, of a round, or roundish-ovate form, and somewhat oblique, having the anterior margins often slightly lobed, serrate, from three to five-nerved, rugose, tomentose underneath, scabrous above, and of a very hard texture, about six inches long, and four or five broad. *Stipules* subulate, hairy, caducous. *Peduncles* axillary, generally from one to four together, of various length, two or three-flowered. *Bractes* small, subulate, caducous. *Calyx*, *leaflets* linear-lanceolate, expanding nearly three times the length of the petals. *Petals* obovate, with the apices a little notched, having the *nectarial scales* small, transversely oval, and ciliate round the anterior margin. *Filaments* numerous, inserted on a slightly elevated receptacle. *Germ* ovate, very hairy, two-celled, with four or six ovula in each, vertically attached to the partitions. *Style* longer than the stamina. *Stigma* of two spreading, laciniate divisions. *Drupe* the size of a large gooseberry, nearly round, being only a little vertically compressed, when ripe of a brownish-grey, and a little hairy. *Pulp* glutinous, and of a very pale yellow colour. *Nuts* four, obovate, rugose, thick and hard, one-celled, one-seeded, attached to the base of a slender fibrous axis. *Seed* conform to the nut, covered with a double integument. *Perisperm* two-lobed, united at the base round the radicle. *Embryo* erect. *Cotyledons* oval, as large as the perisperm, which they divide in two. *Radicle* oval, lodged in

the base of the perisperm, close to the umbilicus of the nut. Page Carey Ed.

3. G. *pedicellata. R.*

Leaves oblong, pointed, three-nerved, serrate, smooth. *Stipules* ensiform. *Peduncles* axillary and terminal, many times longer than the petioles, from three to six-flowered. *Germ* and finally the drupe long-pedicelled; *nuts* four, one-seeded. II. 586

A native of Amboyna.

4. G. *lanceæfolia. R.*

Shrubby. *Leaves* exactly lanceolate, acuminate, serrate, smooth. *Peduncles* in axillary pairs, three-flowered. *Stipules* subulate.

A native of Chittagong, where it flowers in November.

5. G. *excelsa. Vahl. symp.* 1. *p.* 35. *Willd.* 2. *p.* 1166.

Shrubby, all the tender parts hoary, except the upper surface of the short-petioled, unequally-oblong, three-nerved, serrate leaves. *Stipules* ensiform. *Peduncles* from one to four, axillary, three-flowered.

A native of Chittagong, where it blossoms in April.

6. G. *orientalis. Willd.* 2. 1165.

Shrubby. *Leaves* ovate-cordate, serrate, lucid above. *Peduncles* lateral, or axillary, solitary, three-flowered; *drupes* with four, two or three-celled nuts.

Pai-paroe. *Rheed. Mal.* 5. *t.* 46.

Teling. Peyar.

A large, somewhat scandent, or leaning shrub, common in forests over India. Flowering time the rainy season.

7. G. *asiatica. Willd.* 2. 1166.

Arboreous. *Leaves* round-cordate, serrate, downy. *Peduncles* axillary, collected, longer than the petioles, three-flowered; *drupes* round, with one or two, one-celled nuts.

Beng. Phulsa.

A native of various parts of India, and often cultivated in gardens. It flowers about the end of the cold season, the fruit ripens in April, and May, and is palatable to most people. II. 587

8. G. *salvifolia. R.*

Shrubby. *Leaves* lanceolate, serrate, three-nerved, hoary underneath. *Stipules* lanceolate. *Peduncles* axillary, long, and slender, one, two, or three-flowered. *Drupes* round, with two one-celled nuts.

Teling. Pootikee.

A native of Coromandel. It blossoms during the rainy season.

9. G. *hirsuta. Vahl. symb.* 1. 34. *Willd.* 2. 1166.

Shrubby. *Leaves* lanceolate, serrate, very downy. *Stipules* and *bractes* subulate. *Peduncles* one, two, or three, axillary, three or four-flowered; *drupe* four-sided, with four, one-celled nuts.

Teling. Jovellikee.

A large shrub, a native of Coromandel; it blossoms during the hot and rainy season, and the fruit, which is very generally eaten by the natives, ripens in three or four months.

10. G. *tiliæfolia. Vahl. symb.* 1. 35. *Willd.* 2. 1167.

Arboreous. *Leaves* round-cordate, serrate, smooth. *Stipules* transverse, semi-cordate, falcate. *Peduncles* axillary, numerous, three or four-flowered. *Drupes* two lobed; *nuts* from three to six-celled.

A native of the Circar mountains. It flowers during the hot season. The fruit of this is also eaten by the natives.

11. G. *carpinifolia. Juss.*

Shrubby. *Leaves* subsessile, cordate-oblong, serrate, scabrous. *Peduncles* one, two, or three, axillary, short, three-flowered. *Petals* linear, with apices bipartite. *Drupes* one, two, three, or four-lobed. *Nuts* from one to four, from one to three-celled.

Teling. Nullee. II. 588

A native of the Circars. It flowers during the rainy season.

12. G. *pilosa. R.*

Shrubby. *Leaves* lanceolate, serrate, hairy. *Peduncles* axillary, solitary, length of the petioles, three-flowered. *Drupe* twice two-lobed, hairy; *nuts* two-celled, with one seed in each.

A native of the interior parts of Bengal. It flowers during the rains.

Shrubby, erect, soon dividing into many, slender, expanding *branches; young shoots* covered with much hair. *Leaves* alternate, bifarious, short-petioled, lanceolate, with the bases obliquely cordate, three-nerved, serrate, hairy on both sides, from three to six inches long, and about one broad. *Stipules* subulate, hairy. *Peduncles* axillary, solitary, rarely two in the same axill, about the length of the petioles, three-flowered. *Flowers* small, white when they first expand, afterwards becoming yellow. *Pedicels* shorter than the peduncles. *Bractes* linear-lanceolate, hairy. *Calyx; leaflets* lanceolate, expanding, hairy. *Petals* scarce half the length of the calyx, lower half enlarged and fringed with a gland on the centre. *Filaments* many, shorter than the style. *Germ* elevated on a fleshy receptacle, very hairy. *Style* cylindric. *Stigma* two or three-cleft; *segments* pencil-formed. *Drupe* twice two-lobed, hairy, of the size of a marrowfat pea. *Nuts* four, each two-celled, with a single seed in each cell.

It differs specifically from my *hirsuta*, the only species known to me for which it can be mistaken, in having solitary peduncles, two or three-cleft stigma, and nuts with two cells. The leaves are also much longer and more hairy, so is the whole plant.

13. G. *polygama. R.* II.

Polygamous. Shrubby. *Leaves* lanceolate, serrate, hairy. *Peduncles* axillary, longer than 589

Page Carey Ed. the petioles, from two to six-flowered. *Drupe* thin; each two-lobed, with a solitary one-celled, one-seeded nut in each.

A native of the interior parts of Bengal. Flowering time the rainy season; the seed ripens during the cool months of November and December.

Trunk trifling. *Branches* bifarious, spreading; *young shoots* downy and scabrous. *Leaves* alternate, bifarious, short-petioled, lanceolate, serrate, three-nerved, both sides downy, particularly the under one, and hairy; about four inches long and about one broad. *Stipules* subulate. *Peduncles* axillary. In the male two, three, or four together, two or three times longer than the petioles, round, hairy, each supporting from two to six pedicelled, small white flowers. *Bractes* or *involucres* subulate, villous, generally one to each pedicel. *Calyx; leaflets* linear, expanding, villous, twice the length of the petals. *Petals* oblong, with apices entire, and the usual hairy nectarial mark on the inside of the lower half. *Filaments* numerous. In the male flowers inserted on an elevated receptacle; in the hermaphrodite ones round the base of the germ, and mixed with much white hair. *Pistil;* in the flowers of the male plant there is nothing like one. In the female it is roundish, and very hairy. *Style* longer than the stamens. *Stigma* very large, stellate. *Drupe* four-lobed, hairy. *Lobes* about the size of a small pea, each containing a single, one-seeded nut.

It differs from G. *pilosa*, in being polygamous, and the nuts being one-celled. It is also nearly allied to my G. *tomentosa*, the best distinguishing mark is the male flowers in this species.

14. G. *sepiaria. R.*

Shrubby, *Leaves* obovate, serrate. *Peduncles* axillary, solitary, three-flowered. *Berries*
II. twin, singly two-lobed, with one seed in each.
590 *Hind.* and *Beng.* Pan-saura.

It is found all over Bengal, where it is often employed with *Trophis aspera (Soura)* to make hedges, and a remarkably close, evergreen one they make. Flowering time the rainy season.

Stems scarcely to be distinguished from the numerous, bifarious, spreading branches, and branchlets, with which it is enveloped; *young shoots* scabrous. *Leaves* bifarious, alternate, short-petioled, obovate, serrate, three-nerved, of a deep, lively green colour, at the same time scabrous to the feel; size exceedingly various, but in general small. *Stipules* setaceous. *Peduncles* axillary, solitary, scabrous, about half the length of the leaves, three-flowered; *pedicel* thickening, shorter than the peduncles. *Bractes* a few, small, round the apex the peduncles like an involucre. *Calyx*, &c. as in the genus. *Berries* twin, each two-lobed with one seed in each lobe.

15. G. *sapida. R.*

Suffruticose. *Leaves* oblong, sublobate, small, five-nerved, scabrous. *Peduncles* axillary, four times longer than the petioles, several together, three-flowered. *Petals* two-toothed. *Drupes* round, with from one to three one-seeded nuts.

A native of Bengal. It flowers during the hot season; the fruit is small, but palatable.

16. G. *obliqua. R.*

Arboreous. *Leaves* short-petioled, obliquely-cordate, repand, minutely dentate, scabrous above, downy underneath. *Peduncles* axillary, three-flowered. *Drupe* with four, two-celled nuts.

A native of Hindoostan. This has by far the largest fruit of any *Grewia* I have yet met with.

II. 17. G. *heteroclita. R.*
591 *Leaves* alternate, short-petioled, linear-oblong, cuspidate, entire. *Stamina* in five pairs, each united at the base with a sterile filament. *Stigma* simple.

A native of the Molucca Islands.

18. G. *didyma. R.*

Sub-arboreous. *Leaves* lanceolar, serrate, smooth, fine-pointed. *Peduncles* axillary, much longer than the petioles. *Drupes* twin, with two one or two-celled nuts in each.

Teling. All-peyar.

A native of the Circar mountains; it flowers during the rainy season.

19. G. *aspera. R.*

Arboreous. *Leaves* round-cordate, serrate, sometimes lobed, scabrous. *Peduncles* short, axillary, several together, three or four-flowered. *Drupes* four-sided, with four one or two-celled nuts.

A native of the Circar mountains.

20. G. *umbellata. R.*

Shrubby, scandent. *Leaves* cuneate-oblong, serrate. *Umbellets* terminal. *Petals* linear, entire. *Receptacle* cylindric, with pentagonal base.

A native of Sumatra. It flowers in the Botanic garden at Calcutta in April and May.

21. G. *paniculata. R.*

Leaves short-petioled, cuneate-oblong, towards the apex serrate, downy, with soft, stellate pubescence, underneath, three-nerved. *Stipules* two-cleft. *Panicles* terminal, mealy. *Petals* entire.

A native of Pulo Pinang, where it was found by Dr. Hunter.

II. 22. G. *ulmifolia. R.*
592 Shrubby, erect. *Leaves* bifarious, broad-lanceolate, having the whole margins serrate, acuminate. *Stipules* simple. *Panicles* terminal. *Petals* retuse. *Drupe* with a single bearded, three-celled nut.

A native of China and of the country about Silhet. It flowers in the rains; the seed ripens during the cool season. In Silhet it grows to be a tree, the fruit is the size of a gooseberry, and very generally eaten. Page Carey Ed.

23. G. *begonifolia. R.*

Leaves oblong, with the base obliquely-cordate, entire, three-nerved, harsh, with stellate hairs underneath. *Stipules* and primary bractes ear-shaped. *Panicles* terminal, downy.

Found by Mr. Smith at Amboyna in flower in August. From the appearance of his specimens, I imagine it is a tree.

ELAEOCARPUS. Schreb. gen. n. 898.

Calyx five-parted, or five-leaved. *Petals* five, laciniate. *Anthers* with the top two-valved, and bearded, crowned. *Germ* from two to five-celled; *cells* two, or many-seeded. *Drupe* superior, with a tubercled, from two to five-celled nut; *cells* one-seeded. *Embryo* inverse, and furnished with a perisperm.

1. E. *ganitrus. R.*

Leaves alternate, lanceolar, serrulate. *Flowers* racemed. *Stamina* forty, bearded. *Drupes* spherical; *nuts* spherical, five-celled.

Ganitrus *sphærica. Gært. sem.* 2. *p.* 271. *t.* 139.

Ganitrus. *Rumph. Amb.* 3. *p.* 162. *t.* 101.

Sans. Roodraksha.

Hind. Roodrakh.

Beng. Roodrakhya. II.

A tree, a native of various parts of India, as well as of the Malay Archipelago. The following description of the tree was made from one growing in the vicinity of Dacca, which was brought to that place by a fakir some years ago, and there planted in his garden, and is now according to the information of the Honourable Charles Andrew Bruce, about the size of a large apple tree. It blossoms in February and March, and the fruit ripens in November. 593

Leaves alternate, approximate, short-petioled, lanceolar, serrulate, smooth on both sides, but while very young slightly sericeous, about six inches long, and about one and a half broad. *Stipules* minute, conical, caducous. *Racemes* from the former years branchlets below the leaves, and rather shorter than them, simple, drooping, one-flowered. *Flowers* of a middle size, drooping, white. *Bractes* of the pedicel solitary, one-flowered; of the calyx two, opposite, oblong, villous, having the anterior margins dentate and all dropping off at an early period. *Calyx* five-leaved, *leaflets* lanceolate, acute, the length of the petals, slightly villous on both sides; on the inner a small longitudinal rib runs down the middle. *Petals* five, sessile, oblong, the length of the stamina; the exterior half divided into numerous, subulate segments, somewhat villous. *Nectary* none, unless the receptacle of the germ and stamina can be so called, it projects into five obscure lobes, between the insertions of the petals. *Filaments* about forty, short, inserted on a large, convex receptacle on which the germ sits. *Anthers* linear, two-celled, gaping at the apex, where there are sometimes a few distinct hairs. *Germ* superior, ovate, villous, five-lobed, five-celled, with about four seeds in each, attached to the upper end of the axis. *Style* longer than the stamina, five-groved. *Stigma* simple, small, acute. *Drupe* perfectly round, smooth, of the size of a large cherry, and of a deep purple colour; *pulp* firm, rather dry and of a dull brownish yellow colour. *Nut* spherical, thick, very hard, having the surface elegantly tubercled, and marked with five-equi-distant, deep grooves running from the apex to the base, five-celled. *Seeds* generally solitary, though sometimes two, when single, oblong, tapering most at the apex. *Integuments* two; the *exterior* one brown, hard, smooth, and brittle; the *inner* one grey, and membranaceous. *Perisperm* conform to the seed, oily. *Embryo* inverse nearly as long and broad as the peri-sperm. *Cotyledons* oblong, thin, three-nerved. *Plumula* two-lobed. *Radicle* oblong, superior. Gærtner has no doubt mistaken the apex of the drupe of this plant, for the base; and if more proof is required, let me add of *Elaeocarpus serratus* also, where the *embryo* is also inverted, though the nut is never more than three-celled, that being the number of cells in the germ, and also my E. *bilocularis*, where the *perisperm* and *embryo* are the same, and the nut bilocular. I am a very inferior judge of natural orders, but certainly think this cannot belong to the same order with *Garcinia*, in which I include *Gambogia*, and two species of *Xanthochymus*. If it does, I must despair of ever making any progress in this branch of the science. II. 594

2. E. *tuberculatus. R.*

Leaves petioled, obovate-cuneate, remotely-serrulate.

Flowers racemed: *stamina* seventy-five, terminal by a thread. *Drupe* oval, *nuts* ovate, much tubercled, thick-margined, two-celled.

Tam. Roodrach, or Ooderach.

A tree, a native of the forests of Travancore, where it blossoms about the beginning of the hot season. Dr. Berry of Madras, who has procured from Mr. George Young specimens and seeds of this sacred tree, says the nuts are sold by the Sunyasees, or holy men, to the Hindoos, set in gold, and by them wore as a religious ornament. II.

Leaves crowded about the ends of the branchlets, alternate, petioled, long, ovate-cuneate, remotely serrulate, obtuse, smooth on the upper side, somewhat hairy, particularly the rib and veins underneath, from six to twelve inches long, by three or four broad. *Petioles* one-sixth of the length of the leaves, round, a little hairy. *Stipules* conical, hairy. *Racemes* from the axills of the former year's fallen leaves, single; twice the length of the petioles. *Pedicels* al- 595

Page Carey Ed. ternate, drooping, one-flowered. *Bractes* lanceolate, villous, caducous, one under the insertion of each pedicel. *Flowers* larger than in any of the other species I have yet met with. *Calyx* five-leaved. *Leaflets* lanceolate, downy on both sides, more than half of the length of the petals. *Petals* five, unciform, very hairy on both sides; exterior margins deeply divided into numerous capillary segments. *Filaments* numerous, viz. from seventy to eighty, short, inserted into the receptacle, round the base of the germ, very hairy. *Anthers* linear, much longer than the filaments, and terminated by a single, long, capillary point. *Germ* superior, ovate, a little compressed, very hairy, two-celled, with about eight seeds in each, disposed in two vertical rows, and attached to the partitions. *Style* rather longer than the stamina. *Stigma* acute, simple. *Drupe* oval, smooth, of the size of a small apple; in the dry state, in which only I have seen it, covered with a considerable portion of a friable substance under the thin, tender, smooth cortex. *Nut* ovate, or oval, compressed, much tubercled on each of the flat sides, having an elevated sulcate ridge from the apex to the base, which marks where the two valves separate, of a tough, hard, ligneous texture, two-celled, though one is very often abortive, two-valved; *partitions* contrary. *Seed* generally solitary, rather thin, long-ovate. *Integuments* uncertain. *Perisperm* conform to the seed, horny. *Embryo* very nearly as long and broad as

II. the perisperm, inverse. *Cotyledons* thin, three-nerved. *Radicle* sub-cylindric, superior.

596 3. E. *serratus. Willd.* 2. 1169.

Leaves alternate, broad-lanceolar, serrate. *Stamina* thirty, bearded. *Drupes* oblong. *Nut* porous, with three-cells.

Perin Kara. *Rheed. Mal.* 4. *t.* 24.

Beng. Julpai, the name it is known by in the gardens at Calcutta.

This small tree is now common in the Company's Botanic garden. It is a native of the interior provinces, towards the mountains. It flowers during the hot season.

Leaves spreading about the extremities of the branchlets, alternate, petioled, oblong, serrate, smooth, of a shining green on both sides, from four to five inches long. *Petioles* nearly round, smooth, an inch and a half long. *Stipules* minute. *Racemes* solitary, simple, just below the leaves of the present year's shoots, or from the axills of the fallen leaves. *Flowers* very numerous, small, white, surrounding every part of the raceme, all pointing to the earth. *Bractes* most minute. *Calyx* five-leaved. *Petals* five, wedge-formed, beautifully fringed. *Nectary*, five large fleshy glands surrounding the base of the germ. *Filaments* thirty, inserted into the upper and inner sides of the nectarial glands. *Anthers* linear, with the apex bearded. *Germ* superior, round. *Style* single, pointed, as long as the corol and stamens. *Drupe* size of a large olive, and very much like one, even in colour when ripe. *Nut* very hard, pointed, oblong, smooth, with three equi-distant spurious sutures, that do not open, smooth, except for small pits like those of the almond, but smaller, three-celled. *Seeds* oblong, smooth.

Without success I have tried to extract oil from the fruit. They are dried and used in curries by the natives, and also pickled.

II. 4. E. *rugosus. R.*

597 *Leaves* subsessile, obovate-oblong, serrate, smooth. *Racemes* below the leaves, single. *Stamina* thirty, terminated by a single thread. *Drupe* oval; *nut* rugose, thin-edged, from one to two-celled.

Bun Julpai, the vernacular name in Chittagong, where it is indigenous, and grows to a great size, with a scanty crown. Flowering time March; the seed ripens in June and July.

Leaves about the ends of the branches, alternate, subsessile, obovate-oblong, serrate, of a firm texture, smooth on both sides, except when very young, thin, and clothed with a little ferruginous down; from six to twelve inches long, and from four to six broad. *Racemes* numerous, under the leaves, and shorter than them, spreading nearly horizontally. *Flowers* large, long-pedicelled, drooping. *Peduncles* and *pedicels* clothed with dark ferruginous down. *Bractes* small, caducous. *Calyx* five-leaved; *leaflets* lanceolate, on the outside downy. *Petals* five, subcuneiform, villous, with the apex irregular, and deeply cut into numerous filiform segments. *Filaments* thirty, short, inserted round the base of the germ, into a villous receptacle. *Anthers* linear, crowned with a single thread. *Germ* superior, villous, grooved, two-celled, with about eight ovula in each, attached in an imbricated order, in two vertical rows from their apices to the middle of the partitions. *Style* longer than the stamina. *Stigma* simple. *Drupe* obovate, of the size of a small pullet's egg, smooth, of an olive yellow. *Nut* oblong, a little pointed, rugose, having the edges sharp, thick, hard, and tough, one, rarely two-celled. *Seed* solitary, oblong. *Integument* single, thick and brown. *Perisperm* conform to the seed, horny. *Embryo* inverse. *Cotyledons* very thin, oblong, three-nerved, nearly as broad and long as the perisperm. *Plumula* two-lobed. *Radicle* ovate, superior.

II. 5. E. *rubustus. R.*

598 *Leaves* ovate-oblong, serrate, acuminate, smooth. *Stamina* fifty, bearded. Dulpai probably *Julpai*, is the vernacular name in Silhet, where it is indigenous, and grows to be a very large tree. *Flowering* time the beginning of the rains in June.

Young shoots slightly villous. *Leaves* alternate, petioled, ovate-oblong, serrate, acuminate, smooth, thick, and of a hard texture, about six inches long, and three broad. *Petioles* about an inch long. *Racemes* axillary, and from those of the last year, solitary, simple, diverging with a curve, villous, scarcely so long as the leaves. *Flowers* numerous, large, white, fragrant, pedicelled, drooping. *Calyx* of five lanceolate, hoary leaflets. *Petals* five, broad-cuneiform, with the exterior margin multifid. *Nectarial* glands five, large, villous. *Filaments* fifty, nine between each pair of glands, and one from the inside of the apex of each short. *Anthers* linear, gaping at the top, and somewhat bearded. *Germ* oval, three-celled, with two *ovula* in each attached to the axis. *Style* shorter than the petals. *Stigma* small, tri-dentate. *Drupe*

oval, of the size of a pigeon's egg, smooth, of a yellow olive colour, and pulpy; when ripe one-celled. *Nut* oblong, rugose, very hard, three-celled, and in time having three valves. *Seed* solitary, linear, oblong. *Perisperm* conform to the seed, soft and oily. *Embryo* inverse, &c. as in the other species. Page Carey Ed.

6. E. *lanceæfolius. R.*

Leaves alternate, lanceolar, serrate, smooth. *Stamina* fifteen, bearded. *Drupe* long, turbinate, with a one-celled nut of nearly the same shape.

Sufed-pai, is the vernacular name in Silhet, where it grows to be a middling sized tree. Flowering time the beginning of the rains; the fruit ripens in September and October.

Young shoots round and perfectly smooth. *Leaves* about the ends of the twigs, alternate, short-petioled, broad-lanceolar, serrate, rather obtuse, pointed, smooth on both sides, from four to six inches long, and scarcely two broad. *Stipules* none. *Racemes* axillary, and from those of the last year, solitary, diverging with a curve, rather shorter than the leaves. *Flowers* alternate, pretty long-pedicelled, recurvate, small, white. *Calyx* five-leaved; *leaflets* lanceolate. *Petals* five, cuneiform; exterior margin deeply laciniate. *Nectarial* glands five, large, embracing the lower part of the germ. *Filaments* fifteen, short, two between the nectarial glands and one from the inside of the apex of each of them. *Anthers* linear, gaping at top, and there somewhat bearded. *Germ* ovate, three-celled, with two *ovula* in each, attached to the axis. *Style* the length of the corol. *Stigma* small, three-toothed. *Drupe* long, turbinate, of the size and appearance of a large olive, smooth, when ripe of a greenish yellow, one-celled. *Nut* sub-clavate, turbinate, tapering most towards the base, and having there a superficial perforation, one-celled, three-valved. *Perisperm* conform to the seed. *Embryo* inverse. *Cotyledons* cordate-lanceolate. *Radicle* superior. II. 599

7. E. *aristatus. R.*

Leaves petioled, obovate-cuneate, obtuse, and obtusely serrulate. *Racemes* axillary. *Stamina* from forty-five to fifty, awned. *Drupe* oval; *nut* generally one-celled.

Ran dulia is the vernacular name in Silhet, where it is indigenous, and grows to be a tree of very considerable magnitude. Flowering time in April, and the fruit ripens in August.

Young shoots thick, and rather rough, with a few hairs, which soon disappear by the wind, friction, &c. *Leaves* alternately crowded about the ends of the branchlets, petioled, cuneate-obovate, obtuse, and obtusely serrulate, smooth on both sides, and firm in texture; from four to six inches long and from two to three broad. *Petioles* about an inch long, with a very few short hairs scattered over them. *Stipules* subulate, hairy, caducous. *Racemes* axillary, drooping and spreading, of the length of the leaves, a little hairy. *Flowers* few, long-pedicelled, generally drooping, large, yellow, and fragrant. *Calyx* of five, lanceolate, hairy, villous leaflets. *Petals* five, cuneiform, having the exterior margin deeply laciniate, very hairy, particularly on the outside; the hairs white, depressed, and pointing forward. *Filaments* regularly from forty-five to fifty, short, smooth, and slender, inserted in five, scarcely distinct bundles, on the top of the hairy receptacle. *Anthers* linear, opening at the top, the exterior lip of this mouth is continued into a pretty long, simple, straight arista. *Germ* ovate, very hairy, and elevated on the usual receptacle, which is here very hairy, two-celled, with from ten to twelve *ovula* in each, attached in two vertical rows, to the middle of the partition. *Style* subulate. *Stigma* acute. *Drupe* the size, shape, and colour of a large olive. *Nut* oblong, both ends pointed, having a pretty large rib on each of the flattened sides running from the base of the apex, one, rarely two-celled, surface a little rugose, texture both hard and tough. *Seed* solitary, oblong, flat. *Integument* single, thick, hard, and of a dark brown. *Perisperm* conform to the seed, cartilaginous. *Embryo* inverse. *Cotyledons* as much extended as the perisperm, oblong, very thin, three-nerved. *Radicle* oval, superior. II. 600

8. E. *lucidus. R.*

Leaves long-petioled, broad-lanceolar, remotely serrate, lucid, two minute glands at the base.

A tree, a native of Chittagong.

9. E. *fruticosus. R.*

Shrubby. *Leaves* opposite, broad-lanceolate, serrulate. *Corymbs* axillary. *Petals* much lacerated, united by woolly margins. *Stamens* and *pistil* inserted on a large receptacle. *Anthers* bearded. II. 601

A native of the Moluccas, dried specimens have only been seen, the genus is therefore doubtful, and the more so as the leaves are opposite.

VATERIA. Schreb. gen. n. 906.

Gen. Char. *Calyx* five-cleft, permanent. *Corol* five-petalled. *Germ* superior, three-celled; *cells* two-seeded; *attachment* superior. *Capsule* one-celled, three-valved. *Seed* solitary. *Embryo* inverse, no perisperm.

1. V. *lanceæfolia. R.*

Leaves alternate, lanceolate, entire. *Panicles* axillary. *Stamina* fifteen.

Moal, the vernacular name in Silhet.

A middling sized, spreading tree, a native of the hills in the vicinity of Silhet, and Chittagong, where it flowers in May, and the seed ripens in July and August.

From wounds, &c. in the bark, a clear liquid exudes, which soon hardens into a very pure pale amber coloured resin, from which the natives obtain by distillation, a dark coloured, thick, strong smelling balsam, called chóoa, or chova, by the people who prepare and sell it; and *Goond* by the brahmins, who use it in their religious ceremonies and temples.

Page Carey Ed. *Branches* numerous, and generally reclinate. *Bark* of the old ligneous parts pretty smooth and ash-coloured; of the *young shoots* quite smooth. Wood white, and very close in the grain. *Leaves* alternate, short-petioled, lanceolate, some of the largest may be called oblong; all are entire, some obtuse, some acuminate; all are smooth-pale; coloured underneath, from four to
II. eight inches long and from one to three broad, with simple veins extending to the margin.
602 *Panicles* axillary, shorter than the leaves, composed of several, alternate, compound, smooth branches. *Flowers* numerous, pretty large, white, and fragrant; in the bud imbricated. *Calyx* five-parted, outside hoary, permanent, and much increased in size by the time the seeds are ripe; *segments* ovate, and acute. *Petals* five, linear-falcate, obtuse, spreading, with a concave base, forming a gibbous tube round the stamina and pistillum, and hiding all except the stigma; in the bud imbricated. *Filaments* fifteen, very short and thick, inserted into the receptacle, round the base of the germ, one opposite to each petal, and two between. *Anthers* short, ovate, two-lobed; crowned with a single subovate gland. *Germ* superior, ovate, ribbed, villous, three-celled, with two *ovula* in each, attached to the top of the axis in a way perfectly distinct from Jussieu's *Guttiferæ*. *Style* short. *Stigma* clavate, three-toothed. *Capsule* ovate, of the size of a pigeon's egg, rather thick, and of a pretty firm texture, when dry one-celled, three-valved, opening from the apex. *Seeds* generally one, sometimes two, scarcely ever more, when single, conformed in shape to the capsule. *Integuments* single, smooth, dark brown and thin. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, conform to the seed, nearly equal, thick, and of a firm fleshy texture; one or both bifid from the apex to the attachment of the circle, which is a little below the middle, two-toothed. *Radicle* lanceolate, superior. The whole being very exactly the perfect *embryo* of the other *Shoraceæ*, only the cotyledons are here more equal than in the genus *Shorea* itself.

2. V. *indica. sp. pl.* 734. *Gært. sem.* 3. 52. *t.* 189.

Leaves alternate, oblong. *Panicles* terminal. *Stamina* from forty to fifty.

Eleocarpus *copaliferus. Retz. Obs.* 4. *n.* 85. *Willd.* 2. 1170. *Vahl. symb.* 3. 6. 7.

II. Paenoe. *Rheed. Mal.* 4. *t.* 15.
603 Peini marum. *Buch. Journey in Mysore, Canara, &c.* 2. 476.

A very large and handsome tree, a native of Malabar. In the Bednore country, it is called the Dammar tree by the English, and blossoms during the hot season; the seed ripens in August.

Note. In all the flowers examined by me the stamina had uniformly short broad filaments, and linear anthers, terminating in a single, tapering, acute thread, or soft bristle. Can König's Ceylon tree with two bristles be the same? The superior calyx of Retz, I must consider a mistake. However the genus is perfectly distinct from *Eleocarpus*, and every other known to me.

Young shoots and all tender parts, except the leaves, covered with fine stellate pubescence. *Leaves* alternate, petioled, oblong, entire, from emarginate to obtuse, pointed, smooth, coriaceous, from four to eight inches long, and from two to four broad. *Petioles* round, about an inch long. *Stipules* oblong. *Panicles* terminal, ramifications rather remote. *Flowers* rather remote, pedicelled, pretty large. *Bractes* oblong, one-flowered. *Calyx* five-cleft to the base; *divisions* oblong, obtuse, villous on the outside. *Corol* five-petalled. *Petals* oval, emarginate, broader but very little longer than the divisions of the calyx. *Filaments* from forty to fifty, short, broad, inserted between the petals and the base of the germ. *Anthers* linear, with a single filiform beak. *Germ* superior, conic, downy, three-celled; *cells* containing three *ovula*, each attached to the top of the axis. *Style* longer than the stamens. *Stigma* acute. *Pericarpium* a coriaceous, fleshy, oblong, obtuse, one-celled, three-valved *capsule*; general size about two and a half inches long, and one and a half in diameter. *Seed* solitary, shape of the capsule.

II. Abundance of the resin called *copal* exudes from this tree, in its native soil. When
604 recent it is found from pale green, to a deep amber colour, with all the intermediate shades. In some parts of India beads are made of such pieces as most resemble amber beads, so much like that substance is it, even to being electrical when excited by rubbing.

The resin or substance as it flows from the tree, applied while in its fluid state, makes a good varnish, called Piny Varnish on the Malabar Coast, and there the tree is commonly called the Piny Varnish tree, or Piny Marum. It is mentioned by Dr. Buchanan in his *Journey through Mysore, Canara, and Malabar, vol.* 2. *p.* 476; but as that book may not be in the hands of every one, I will transcribe what he says, viz. "Some men of the Panchala tribe, which here is called Peningelan, paint and varnish by the following process. They take butter-milk and boil it with a small quantity of quick lime, until strings form in the decoction, and separate from the watery parts, which they decant. The stringy matter is then mixed with the paint, which has been well-powdered; with these the wooden work is first painted, it is then allowed to dry for one day, and afterwards receives a coat of Pundum, which is the fresh juice of a tree called Peini Marum. The Pundum must be used while it is fresh, and will not keep for more than two or three days. After the first coat of Pundum has dried, another coat of paint is given, and that is followed by another of varnish. In the same manner leather may be painted and varnished. The varnish effectually resists the action of water. All my attempts however to find out the varnish tree were vain."

MESUA. Schreb. gen. n. 1146.

II. Gen. Char. *Calyx* four-leaved. *Corol* five-petalled. *Germ* superior, two-celled; *cells* two
605 seeded; *attachment* sub-inferior. *Capsule* one-celled, two-valved. *Seeds* from one to four. *Embryo* erect, without perisperm.

M. *ferrea. Willd.* 3. 843. Page Carey Ed.

Leaves lanceolate.

Nagacesara, Nagkesura, Sunscrit names. See *Asiat. Res.* 4. 295.

Beng. Nagsara or Nagkesur.

This most elegant tree is only, so far as I can learn, found in gardens in Bengal. I never saw it on the Coromandel coast. Flowering time the beginning of the warm season.

Trunk straight, and beautifully slender in proportion to its height; *bark* smooth, dark ash-coloured. *Leaves* opposite, short-petioled, lanceolate, entire, veinless, above smooth, and shining; underneath whitish, with a subtile dust, which may be rubbed off, from three to six inches long, and one or a little more broad. *Flowers* terminal, rarely axillary, solitary, or in pairs, short-peduncled, large, delightfully fragrant, petals pure white, with a large globe of bright gold-coloured anthers in the centre. *Bractes* none. *Calyx* four-leaved; *leaflets* orbicular, concave, the inner pair somewhat large, and with membranaceous margins. *Petals* four, expanding, nearly obcordate, curled; *margins* often torn, and forcibly bent inward from their situation in the strong calyx before expansion. *Filaments* numerous, several hundreds, about one-fourth part of the length of the petals, filiform, slightly united at the base, unto a fleshy ring. *Anthers* linear.* *Germ* superior, ovate, conic, two-celled, with two ovula in each attached II. to the lower and inner angle of the cell, where the thickened base of the partition forms the 606 receptacle. *Stigma* peltate. *Capsule* size of a crab-apple, nearly round, with an acute point, one-celled, the partition being nearly obliterated, two-valved. Valves thick, firm, somewhat fibrous, scabrous on the outside, glossy, light brown within. *Seeds* from one to four, shape conform to the number in the capsule, attached as in the germ. *Integument* single, and much like that of the common chesnut. *Perisperm* none. *Embryo* erect. *Cotyledons* two, conform to the seed, fleshy, pale-yellow. *Radicle* minute, patelliform, inferior.

CALOPHYLLUM. Schreb. gen. n. 1587.

Gen. Char. *Calyx* none. *Corol* eight-petalled, unequal. *Stamina* fascicled *(polyadelphous.) Germ* superior, one-celled, one-seeded; *attachment* inferior. *Drupe* superior, dry, globular, one-seeded. *Embryo* erect, without perisperm.

1. C. *Inophyllum. Willd.* 2. 1157.

Leaves oval, with the base round, polished. *Flowers* polyadelphous.

Ponna marum. *Rheed. Mal.* 4. *t.* 38.

Teling. Poona.

Hind. Sultana-champa.

This most elegant tree is to be found in a cultivated state over most parts of India, and is indigenous near the shores of the southern parts. It is in flower and fruit most part of the year, and is particularly beautiful.

Trunk seldom straight, often as thick as a man's body. *Branches* numerous. *Bark* tolerably smooth, greenish-grey. *Leaves* opposite, short-petioled, oval, emarginate, remarkably smooth, and opening on both sides, with numerous parallel veins; four inches long and from II. two to three broad. *Stipules* none. *Racemes* axillary, drooping, few-flowered. *Flowers* pretty 607 large, pure white, fragrant. *Bractes* minute, falling early. *Calyx* and *corol* so much alike in colour, as not to be distinguished. *Filaments* about two hundred, generally conjoined into four bodies at the base. *Germ* round, one-celled, with one ovulum attached to the bottom of the cell. *Style* much longer than the *stamina*. *Stigma* large, irregularly lobate, peltate. *Drupe* spherical, above an inch in diameter, smooth, when ripe somewhat yellow, and covered with a small quantity of yellowish pulp, which bats are fond of, one-celled. *Nut* conform to the drupe, &c. as figured and described by Gærtner. *vol.* 1. *p.* 20. *t.* 43. *Perisperm* none. *Embryo* erect. *Cotyledons* seem to be spherical, and remain in the nut during vegetation. *Plumula* two-lobed. *Radicle* inferior, when vegetation begins it pushes through the bottom of the nut where it was attached to the envelope, leaving the cotyledons in the nut under the ground.

2. C. *Bintagor. R.*

Twigs cylindric. *Leaves* oblong, emarginate; *base* tapering, lucid, finely veined.

From the Mauritius plants have been received into the Botanic garden at Calcutta, where they grow freely, and though they have not yet blossomed, the leaves evidently point out a specific difference between this and the first species.

Bintagor maritima, Rumph. Amb. 2. *t.* 71, is but a bad figure of this beautiful tree, the fruit is double the size of those produced by the only species I have yet found on the coast of Coromandel, which I consider to be *Inophyllum.* Louriero's *Balsamaria* may be either, for what I can say.

Seeds received from Otaheite were about the size of Rumph's; they have produced plants II. with leaves, only a little more lengthened in proportion to their breadth than those of the 608 Mauritius trees. In other respects they are alike.

3. C. *angustifolium. R.*

Twigs cylindric. *Leaves* short-petioled, lanceolate, with lengthened, somewhat obtuse points, lucid, finely veined. *Flowers* in axillary fascicles; *pedicels* with a cyathiform apex.

A native of Prince of Wales's Island, &c. to the eastward of the Bay of Bengal, where it

* The stamens are generally permanent and as the capsule enlarges, the ring which they formed [illegible] the appearance of being polyadelphous.

I am informed that the Grandees of Ava, stuff their pillows with the dried anthers of this plant, on account of their fragrance.

(Page Carey Ed.) grows to be a tree of great size, and I am told yields the straight spurs, commonly called *Peon*, in these countries are used for the masts of ships.

4. C. *tetrapetalum. R.*

Leaves short-petioled, ovate, lanceolate, very finely serrulate. *Umbels* axillary. *Corol* four-petalled.

A native of the Moluccas.

5. C. *Suriga. Buch.*

Leaves linear-oblong, polished. *Flowers* verticelled below the leaves. Calophyllum Soulattri, *Burm. Fil. end.* 121. The tree is a native of the mountains of that Coast. The flowers are large, beautiful and fragrant.

6. C. *lanceolarium. R.*

Twigs square. *Leaves* lanceolar, obtuse, lucid, finely veined.

From the Mauritius this very beautiful species has been introduced into the Botanic garden at Calcutta, but as it has not yet blossomed, the genus is not certain, though the habit and foliage are pretty strong proofs of its belonging to this genus.

II. 609

HOPEA. R.

Gen. Char. *Calyx* five-leaved, two of them increasing with the capsule into wings. *Corol* one-petalled, contorted. *Filaments* ten, inserted on the tube of the corol, alternately two-cleft. *Anthers* fifteen. *Germ* superior, three-celled; *cells* two-seeded; *attachment* superior. *Capsule* one-celled, one-valved. *Seed* solitary. *Embryo* inverse, without perisperm.

The great affinity of this genus to *Shorea* and *Dipterocarpus* induced me to place it here, rather than in *Dodecandria*, where it formerly stood. It is so named in memory of the late Dr. John Hope, professor of Botany in Edinburgh. The genus formerly so called is now referred to *Symplocos*, and *Vahl's Hopea, En. pl.* 1. 3. is my *Pladera pusilla. Exam. sessile Willd.* 1. 636.

1. H. *odorata. R.*

Leaves ovate-oblong, a hollow gland in the axills of the large veins.

A single tree, and the only I have seen, grows in the garden of Mr. Dowdeswell near Calcutta. Its native place, the mountains to the eastward of Bengal. Flowering time the month of March. The seed ripens in May and June.

Trunk of the above-mentioned single tree straight, four feet in circumference, and high in proportion. *Branches* numerous, spreading in every direction, and adorned with many long, slender, drooping, expanding, bifarious branchlets, covered with dark brown, smooth bark. *Leaves* alternate, short-petioled, bifarious, drooping, ovate-oblong, entire, waved, smooth, shining, of a deep green on both sides, having often on the under side a pretty large single gland
II. 610 in the axills of the large veins. *Stipules* subulate, falling off at a very early period. *Panicles* terminal, and from the exterior axills, drooping, composed of alternate, bifarious, secund, recurved, villous ramifications of numerous small, pale yellow, delightfully fragrant flowers. *Bractes* cordate, acute, villous, caducous. *Calyx* five-leaved; *leaflets* unequal, ovate, villous, permanent, the two largest increasing into two large oblong, obtuse, membranaceous wings, by the time the pericarpium is full grown. *Corol* one-petalled, contorted. *Tube* short, campanulate. *Border* of five oblique, sublinear, oblong, spreading divisions, with their margins revolute, curled, and somewhat villous. *Filaments* ten, about as long as the tube of the corol, and inserted by broad, conical, fleshy bases, into its bottom, alternately larger and bifid. *Anthers* fifteen, two-lobed, with a subulate point from the apex of each, or as in *Asarum* the anthers may be said to adhere to the filaments below their apices. *Germ* superior, ovate, three-celled; *cells* three-seeded, attached to the top of the axis. *Style* straight, the length of the stamens. *Stigma* simple. *Capsule* ovate, pointed, one-celled, evalvular, of a tender texture, closely enveloping a single seed of the same shape and size, outwardly covered with the permanent calyx, two of the leaflets of which are now enlarged into two linear oblong, obtuse, tough, membranaceous, nervous wings, many times longer than the seeds.

The above-described tree is nearly allied to my *Shorea*, as well as to the wood oil tree, Dipterocarpus of the Malay Islands, Pegue and Chittagong. It differs from the first in having only two of the five leaflets of the calyx increasing into wings, in having a more petalous corol, and from *Shorea* in the stamina.

I am inclined to think *Dammara selanica, Rumph. Herbar. Amb. vol.* 2. *p.* 168. *t.* 56,
II. is of the same natural order, particularly as in some parts of India, very large quantities of a
611 resinous substance are also collected from the *Shoreas*, and used in the Marine yards, as a substitute for pitch.

2. H. *eglandulosa. R.*

Leaves ovate, oblong, obtusely acuminate, no glands in the axills of the veins.

A very beautiful large tree, a native of the hills of Tipperah, from thence plants have been introduced into the Botanic garden twelve years, and are not more than ten or twelve feet high though perfectly healthy. *Trunk* perfectly straight, as are the branches, which are scattered equally all round, spreading and dividing much, but never drooping; the bark in this species is of a greyish colour whereas in *odorata* it is dark brown, which mark alone is sufficient to distinguish them.

3. H. *scaphula. R.*

Leaves elliptic, entire, smooth. *Panicles* terminal. *Stamina* inserted on the margin of an expanded receptacle in which the germ is inserted.

Boil shora is the vernacular name in Mascal Island where the tree is indigenous and its

trunk so immensely large, as to be made into canoes by the Mug inhabitants. Flowering time January. Page Carey Ed.

DIPTEROCARPUS. Gœrt.

Gen. Char. *Calyx* one-leaved, permanent, two of the five divisions of its border large, and growing with the pericarp into two very long, scariose wings. *Corol* five-petalled. *Germ* superior, three-celled; *cells* two-seeded; *attachment* interior. *Nut* ovate, one-celled, one-seeded. *Embryo* inverse, no perisperm.

This genus is so nearly related to *Shorea* and *Hopea*, as to induce a belief that they might all be referred to one, but a nearer inspection of the calyx and corol of each will I think justify their being considered three very well defined genera, provided we admit that the *Monophyllus* and *polyphyllus*, *calyx* and *corol* ought to constitute genera, even though they agree in the rest of the character and habit. II. 612

1. D. *turbinatus. Gœrt. Sem.* 3. *t.* 188.

Spikes axillary, drooping. *Leaves* ovate-oblong, glossy and ribbed. *Body* of the *calyx* without wings, or angles. *Anthers* thirty, bristle-pointed.

Beng. Tileeya-gurjun about Tipperah and Chittagong.

A native of Chittagong, Tipperah, Pegue, &c. to the eastward of Bengal, where it grows to be an immense tree. Flowering time the beginning of the hot season; the seed ripens in June.

Trunk straight throughout, to the very top of the tree, and growing to an immense size, even so large as to be made into canoes that will carry an hundred men. *Bark* deeply cracked. *Branches*, the inferior ones spreading, the superior ones ascending. *Branchlets* bifarious. *Young shoots* hoary, and marked with scars of the fallen stipules. *Leaves* alternate, short-petalled, bifarious, ovate-oblong, some entire, some waved, and some are even serrate or dentate, smooth on both sides, of a deep shining, glossy green. *Veins* many, straight, simple and parallel, nearly as in *Dillenia indica;* from four to twelve inches long. *Stipules* within the leaves, very large, sword-shaped, downy, caducous. *Spikes* axillary, drooping, solitary, shorter than the leaves, smooth. *Flowers* solitary, remote, alternate, large, white, with a very slight tinge of red. *Calyx* one-leaved; tube rather gibbous. *Border* five-parted, irregular; two of the divisions being much larger than the other three, and continuing to increase till the seed is ripe. *Petals* five, narrow, obliquely wedge-shaped, smooth on both sides, and entire, except that sometimes they are emarginate. *Filaments* about thirty, short, inserted round the base of the germ. *Anthers* ensiform, each ending in a long, tapering acute point approaching, to the habit of *Vateria Shorea* and *Hopea*. *Germ* superior, ovate, three-celled, with the ovula in each cell attached to the upper end of the axis. *Style* erect, as long as the stamens. *Stigma* three-toothed.. *Capsule* ovate, pointed, one-celled. one-valved of a tender consistence, covered with a little short, soft hairy down, enveloped in the enlarged base of the even calyx, the two larger divisions of its border become two, very large, linear, oblong, scarious wings, beautifully reticulated with veins and nerves. *Seed* solitary, of the shape of the capsule, the radicle issues from its apex leaving the two large cotyledons in the ground. II. 613

This tree is famous all over the eastern parts of India and the Malay Islands, on account of its yielding a thin liquid balsam, commonly called wood oil, which is much used for painting ships, houses, &c.

To procure the balsam, a large notch is cut into the trunk of the tree, near the earth (say about thirty inches from the ground,) where a fire is kept up until the wound is charred, soon after which the liquid begins to oose out. A small gutter is cut in the wood to conduct the liquid into a vessel placed to receive it. The average produce of the best trees during the season, is said to be sometimes forty gallons. It is found necessary, every three or four weeks, to cut off the old charred surfaces, and burn it afresh; in large healthy trees abounding in balsam, they even cut a second notch in some other part of the tree, and char it as the first. These operations are performed during the months of November, December, January and February. Should any of the trees appear sickly the following season, one or more years' respite is given them.

2. D. *costatus. Gœrt. Sem* 3. 50. *t.* 187. II. 614

Tender parts hairy. *Leaves* linear, oblong; *base* rounded, acuminate, hairy underneath. *Stipules* small and hirsute. *Belly* of the calyx five-ribbed, and a little hairy

A native of the coast south of Chittagong, where it is called Tileeya-gujrun: like the other species it grows to be a tree of the first magnitude, and also furnishes the balsam called wood-oil, and is next in proportion to *incanus*. It blossoms in the cold season, and the seed ripens in April and May.

3. D. *incanus. R.*

All the tender parts hairy. *Leaves* ovate, with the *base* somewhat tapering, obtuse, soft, and villous; *spikes*, axillary, half the length of the leaves; belly of the calyx simply five-winged.

Gurjun, is the vernacular name at Chittagong, where the tree grows to a great size, and is said to furnish the largest proportion of the best sort of *wood oil* or balsam mentioned in my description of *D. turbinatus*. Flowering time November and December, and the seed ripens in April.

4. D. *alatus. R.*

Tender parts hairy. *Leaves* from ovate-oblong, to ovate-cordate, acuminate, smooth, and opaque above, harsh underneath, margins ciliate. *Belly* of the calyx five-winged.

Page Carey Ed.

An immensely large tree, a native of Mascal Island, and the neighbouring coast, Pegue, &c. It is the wood oil tree of the latter country.

5. D. *tuberculatus. R.*

Body of the calyx spherical, with five knobs under its five fissures on the outside.

A native of Chittagong where it flowers about the beginning of the hot season, and the
II. seed ripens in June.
615 6. D. *pilosus. R.*

Tender shoots very hairy. *Leaves* petioled, oblong, acuminate ; *base* rounded, hairy underneath ; *stipules* remarkably long, and very hairy.

A large tree, a native of Mascal Island.

SHOREA. R.

Gen. Char. *Calyx*, five-leaved, permanent, enlarging into five long wings. *Corol* five-petalled. *Germ* superior, three-celled ; *cells* two-seeded ; *attachment* superior. *Nut* one-seeded. *Embryo* inverse, without perisperm.

In honour of the Right Honourable Lord Teignmouth, late Governor General of Bengal.

1. S. *robusta. Gært. Sem.* 3. *t.* 186. *Cor. pl.* 3. *N.* 212.

Leaves short-petioled, cordate-oblong ; *stipules* falcate. *Panicles* terminal and axillary. *Stamina* from twenty-five to thirty.

Sala *Uswukurnika*, the *Sunscrit* names.

Beng. and *Hind.* Sal.

An immense timber tree, a native of Morung. Flowers during the hot season. Seeds ripen in June.

In April 1810, a young tree flowered in the Botanic garden at Calcutta, and is the first that has blossomed, though there are young trees in the garden of from twelve to thirteen years growth. The original description of this tree is very correct, all I can add is that the *stipules* are large and falcate. The *stamina* about fifty. *Stigma* three-toothed. *Germ* three-celled, with two ovula in each attached to the top of the axis. The *seed* constantly single. The *Embryo* inverse, and without perisperm. *Cary alobis Gært Sem.* 1. 215. *t.* 45. must at
II. least belong to the same natural order of *Hopea Dipterocarpus*, *Shorea* and *Vateria.*
616 2. S. *camphorifera. R.*

Leaves ovate, acuminate, parallel, veined, smooth. *Flowers* axillary.

Camphor-tree of Sumatra, or that from which both the native camphor, and camphor-oil are obtained on that island.

To John Prince, Esq. of Tappanooly, we are obliged for the following memorandum.

"This tree grows spontaneously in the forests, and is to be found in abundance from the back of Ayers Bougry, as far north as Bacongan, a distance of twenty-five miles. It may be classed among the largest trees that grow on this coast, several within daily view, measuring six or seven feet diameter. Before it acquires such dimensions it is conjectured to be many years old, but it will produce camphor at a much earlier period. A few of the trees do not exceed two or two and a half feet in diameter. The same tree which yields the oil, would have produced camphor if unmolested, the former being supposed to be the first stage of the latter's forming, and is consequently found in younger trees. The natives have no certain means of ascertaining the tree which produces either the one or the other, although there are some men styled *Toongoo* Nir Kapoor, who pretend to that knowledge, but they cannot give any reasons for their judgment beyond favourable dreams, which superstition has rendered infallible ; and it must be admitted that the success of this description of people, in discovering and procuring, is greater than that of the commonality of those who go in search of the camphor ; the distinction may have arisen from the peculiar favour of fortune to some individuals over others, as in most other circumstances of life, from whence they have acquired a celebrity, otherwise they could give some rational reason for their superior success. Both oil
II. and camphor are found in the heart of the tree, occupying a vacuum, which in others is fre-
617 quently filled with pith ; but it does not extend to the whole length ; on the contrary, they are found in small portions of a foot or a foot and half long at certain distances. The method of extracting the oil is merely by making a deep incision with a Malay axe in the tree, about fourteen or eighteen feet from the ground, till near the heart, when a deeper incision is made with a small aperture, and the oil if any in the tree immediately gushes out, and is received in bamboos or any other utensil better approved of. In this manner a party proceeds through the woods, wounding the camphor trees till they attain their object. The camphor is procured in pretty nearly the same way. The trees are cut to the heart about the same height from the ground as in the former instance, till the camphor is seen ; hundreds may be mutilated before the sought for tree is discovered ; when attained it is felled, and cut into junks of a fathom long, which are again split, and the camphor is found in the heart occupying a space, in circumference of the thickness of a man's arm. The produce of a middling sized tree is about eight China catties or nearly eleven pounds and of a large one, double that quantity. The camphor thus found is called the Tentory. It is often the case that the trees which have been cut and left standing in that state, will produce camphor in seven or eight years after, which is distinguished by the name of Oogar, but is inferior in appearance though of the same quality. The sorts of camphor called belly and foot are the scraping of the wood which surrounds it."

2. S. *Tumbugaia. R.*

Leaves ovate cordate, long-petioled. *Panicles* terminal. *Stamina* about one hundred, with bearded anthers. Page Carey Ed.

Tam. Tumbugai.

A large timber tree, a native of the Balaghat mountains; it blossoms in the beginning of the hot season, and the *seed* ripens in June. Both these species yield a large quantity of the resin commonly called Dammar, in India, and very generally used as a substitute for pitch in the Marine yards. The best species are also frequently used instead of the common incense, Benzoin, in the temples of the natives. *Rumphius's Dammara Selanica. Herb. Amb.* 2. 173. t. 56. seems a species of this genus. II. 618

3. S. *Talura R.*

Leaves oblong, obtuse. *Stipules* linear, falcate. *Panicles* axillary and lateral. *Stamina* fifteen.

Tam. Talura.

This is also a timber tree, a native of the Balaghat mountains, where it blossoms during the dry winds and ripens its seed in June. In S. *robusta* the germ is trilocular, with two ovula in each, attached to the top of the axis. Compare with *Vatica Chinensis, Smith. ic. ined.* 36. 36. *t.*

4. S. *longisperma. R.*

Nut sub-cylindric.

A native of Prince of Wales' island.

GARCINIA. Schreb. gen. n. 814.

Gen. Char. *Polygamous, or Dioecous. Calyx* four-leaved. *Corol* four-petalled. *Germ* superior, from four to twelve-celled, with one ovula in each cell, attached to the axis. *Berry* one-celled, from four to twelve-seeded, crowned with the peltate stigma. *Seeds* enveloped in a pulpy aril. *Embryo* simple, erect, furnished with an ample perisperm.

1. *G. Mangostana. Willd.* 2. *p.* 838.

Polygamous. *Leaves* petioled, from oblong to broad-lanceolate; *flowers* terminal, peduncled, female hermaphrodite solitary, male fascicled. *Berries* spherical with the surface even, and containing as far as eight seeds. II. 619

Mangostana Garcinia. Gært. sem. 2. 105. *t.* 105.

Mangostana. Rumph. Amb. 1. *t.* 43. is a bad representation of the female hermaphrodite, or fertile tree.

A native of the Malay Peninsula, and of the Islands to the eastward of the Bay of Bengal, where they often grow to be trees of a large size, with a straight trunk, and numerous spreading opposite branches, and branchlets forming an elegant, conical head. It is in flower and fruit great part of the year. *Leaves* opposite, petioled, oblong, and broad-lanceolar, entire, rather obtuse, having both sides polished, of a firm texture, from six to eight inches long, and from two to four broad. *Petioles* short, marked with rugæ and having a fleshy protuberance on the inside. *Stipules* none.

Male. *Flowers* terminal, pretty long-peduncled, generally three, five, or nine together, large, of a colour which is a mixture of red, green, and yellow. *Bractes* several about the insertion of the peduncles, and round the flower buds themselves, roundish, concave, scariose. *Calyx* of two unequal pairs, of round, concave, spreading *leaflets*. *Petals* four, oval, fleshy, of a yellowish red on the inside and a greenish red on the outside. *Stamina* numerous, collected on the four lobes of a large fleshy receptacle, round the abortive column. *Filaments* short. *Anthers* ovate, oblong, recurved. *Germ* none, but in the centre an inverted, truncated, conical, fleshy body, scarcely rising above the elevated anthers.

Female Hermaphrodite. Flowers sometimes on the same tree with the male, but I believe more generally on a separate one, solitary, rarely tern, peduncled, larger than the male, and of a deeper colour. *Calyx* and *corol* as in the male, the former permanent. *Filaments* many, slender, half the length of the germ, and inserted round its base. *Anthers* irregular, small, and seemingly abortive. *Germ* superior, round, from six to eight-celled, with one ovula in each, attached to the middle of the axis, the part which now forms the lining of the cells and their partitions, in the ripe state, separating readily from the inside of the cortex becomes attached to the seed forming the edible aril; this is exactly the case in all the other species examined by me, hence, when ripe, I consider it a one-celled fruit. *Style* none. *Stigma* peltate, from six to eight-lobed, permanent. *Berry* spherical, of the size of a pretty large apple, crowned with the stigma, having the surface even, (in the other species it is more or less torose as in the common melon,) one-celled. *Cortex* thick, firm, though somewhat spongy, of a dull crimson colour, or between that and a brick colour; taste powerfully astringent. *Seeds* as far as eight, in shape and size like those of the other species, but the fleshy envelope, or aril, is more abundant than in any other, delicately white, and delicious to the taste. *Integument* proper, single and veined. *Perisperm* conform to the seed, firm, entire. *Embryo* simple, erect, filiform, extending through the centre of the perisperm its whole length, and not readily detected until vegetation begins, when a slender perishable root proceeds from the base and the scaly plumula from the apex which lengthens fast, and throws out the chief root from its base, as in the *Palms*; soon after this provision is established, the original, slender radicle perishes; it is the same with all the other species of this genus, as well as of *Barringtonia* and *Xanthochymus*. II. 620

From the earliest accounts we have of this charming tree and its delicious fruit; we learn that all the innumerable attempts hitherto made to familiarize it to other countries, be-

Page Carey Ed. II. 621 sides those in which it is placed by nature, have uniformly proved unsuccessful. For these thirty-five years past I have laboured in vain to make it grow and be fruitful on the continent of India. The plant has uniformly become sickly when removed to the north or west of the Bay of Bengal, and rarely rises beyond the height of two or three feet before it perishes.

2. G. *Cambogia. Willd.* 2. 848.

Leaves lanceolar. *Flowers* terminal, sub-sessile, solitary. *Stigma* from eight to ten-lobed. *Berry* torulose, from eight to ten-seeded.

Mangostana Cambogia. Gært. sem. 2. 106. *t.* 103.

Coddam-Pulli. Rheed. Mal. 1. *t.* 24. is no doubt this very tree, for *Van Rheed* says the fruit is on a peduncle an inch long, yet his figure places the leaves close to the (terminal) fruit; so that it is evident the extremity of the branchlet must have been considered the peduncle. In my G. *Zeylanica* the flowers are axillary.

This grows to be a tree of considerable size in the forests of Travancore, where it is known to the natives by the name *Ghorka Pulli*, consequently we may conclude it to be *Carca-pulli* of Bauhin, Acosta, &c. It flowers in February and March, and its fruit ripens in June and July.

3. G. *Zeylanica. R.*

Dioceous. *Leaves* broad-lanceolar. *Flowers* axillary; *male* subtern and peduncled; *female* sub-sessile and solitary. *Stigma* varicose. *Berry* with as far as eight seeds.

Ghorka or korka of the Cingalese, which is rather an indefinite name, as with the help of an adjective it would apply to various trees and their fruits.

This species is a native of Ceylon, and from thence was introduced into the Missionaries garden at Tranquebar, where the trees grow freely and acquire a middling size, and like most of the other individuals of this whole natural order, yield an inferior sort of Gamboge. *Leaves* opposite, short-petioled, from broad-lanceolar to oblong ventricose, smooth, of a deep lucid green on both sides from four to six inches long, and about two broad. *Petioles* about half an inch long, channelled, smooth.

II. 622 MALE. *Peduncles* axillary and terminal, several together, one-flowered, smooth, from half an inch to an inch in length. *Bracte* an ovate, concave one embraces the base of each peduncle. *Calyx* four-leaved. *Leaflets* round and concave, the exterior pair smaller. *Petals* four, oblong, concave, expanding, double the length of the calyx. *Filaments* about thirty, short, inserted in a fleshy receptacle, which also elevates a small headed column or body in the centre. *Anthers* twin.

FEMALE. *Flowers* axillary and terminal, solitary, sub-sessile, rather larger than the male. *Calyx* and *corol* as in the male. *Filaments* six, seven, or eight, about one for each cell of the germ, slender, short, each headed with something like a small abortive anther. *Germ* round, with from six to eight sulcæate, from six to eight-celled, with an ovula in each attached to the middle of the axis. The part which becomes the aril in the ripe fruit, now forms the wall of the cells. *Style* none. *Stigma* the aril of each seed, now peltate, verrucose, no evident division into lobes. *Berry* the size of a small orange, smooth, when ripe yellow, somewhat torose, having an elevation over each seed, one-celled, crowned with the wonted stigma. *Seeds* as far as eight, each enveloped in its proper succulent aril, but not otherwise separated in the berry, semi-ovate. *Integument* seemingly single, though with care it may be divided into two, tough, veined coats. *Perisperm* and *embryo* exactly as in the species already described.

3. G. *Cowa. R.*

Dioecous. *Leaves* broad-lanceolar. *Flowers* terminal, *male* sub-umbelled; the *female* has one, three, or five flowers, with four, five or ten-cleft sets of abortive stamina. *Stigma* from six to eight-lobed. *Berry* torulose, from four to eight-seeded.

Hind. Cowa.

II. 623 The tree is of a middle size and handsome; it yields an inferior sort of Gamboge, and the fruit edible, though not the most palatable. It is a native of Chittagong, and flowers in February; the fruit ripens in June.

4 G. *lanceofœlia. R.*

Leaves narrow, lanceolar, acute. *Flowers* terminal, solitary. *Stigma*, from six to eight-lobed. *Berry* turbinate, with as far as eight seeds.

A small tree, a native of Silhet, where it is known to the natives by the name Kirindur, and by them cultivated for the fruit, which they are fond of. Flowering time in February; its fruit ripens in July.

5. G. *Kydia. R.*

Dioecous. *Leaves* broad-lanceolar.

Male flowers in terminal and lateral umbellets; *female* also terminal and lateral, but solitary, and sessile, with four sets of unequal, abortive stamina, alternate with the petals. *Berry* from four to eight-seeded, apex depressed with an elevated nipple-like centre, crowned with the stigma.

A native of the Andaman Islands, where it was discovered by Col. Alexander Kyd, and by him introduced into the Botanic garden at Calcutta in 1794, where, when about ten years old, it began to blossom in February, and the fruit to ripen in July. *Trunk* straight, to the top of the tree, as in the common fir, &c. and in trees sixteen years old twenty-seven inches in circumference at four feet from the ground. *Branches* numerous, spreading far and regularly. *Bark* pretty smooth, of greyish brown; if it be wounded, a yellow exudation frequently takes place, which hardens into an inferior kind of gamboge; the extreme height of young trees about thirty feet. *Leaves* opposite, short-petioled, broad-lanceolar, acute, entire, firm and polished, from four to six inches long, and from one to one and a half broad. *Stipules* no

other than a little black or brown gland on each side of the petioles. 624

Male. *Flowers* in little terminal umbellets, pretty large, yellow, and smooth in every part. *Peduncles* nearly as large as the petioles, clavate, one-flowered. *Calyx* four, equal, ovate, obtuse, fleshy, smooth leaves. *Stamina* numerous, inserted on a somewhat four-lobed, large, elevated, convex, fleshy receptacle, which occupies the whole centre of the flower. *Filaments* very short. Anthers four-sided, with a small polliniferous cell in each angle. *Germ*, no vestige of one.

Female. *Flowers* terminal, and lateral, solitary, sessile. *Calyx* and *corol* as in the *Male*. *Stamina* four, small, unequally bifid, or trifid, filaments round the germ, alternate with the petals; *divisions*, subequitant, and ending in a small gland something like an anther. *Germ* from six to eight-lobed, from six to eight-celled; that part which becomes the aril in the ripe fruit now forms the walls of the cells, and is of a paler colour than the rest. *Style* scarcely any. *Stigma* of from six to eight spreading, variously lobate, glandular lobes. *Berry* globular, torulose, of the size of a small orange, smooth, of a deep yellow when ripe, one-celled, with the *vertex* much depressed, in which rises the nipple-shaped apex, crowned with the from six to eight-lobed stigma; *seeds* as far as eight, semiovate, the inside being thin and straight. *Integument* single, tough and veined, the whole enveloped in a large, fleshy, acid aril. *Perisperm* conform to the seed, firm. *Embryo* simple, &c. as in the former species.

This elegant tree is so very like my G. *Cowa*, as not to be distinguished except by the female inflorescence and shape of the fruit, which in size and quality are the same, viz. and exceedingly sharp but pleasant acid, and like the rest of the genus, the aril is by far the more palatable part.

6. G. *purpurea*. *R.* II.

Leaves lanceolar, obtuse. *Stigma* eight-lobed. *Berry* spherical, of a deep purple throughout, with as far as eight seeds. Of this evidently very distinct species I have only specimens with leaves and the ripe fruit sent by Dr. Berry, under the name *Mate mangostan*, which is found in gardens only, and supposed to have been originally brought from the Eastern Archipelago. It differs from every other species in the whole fruit, which is about the size of a small orange, being throughout of a deep purple colour, even the proper pulpy aril of the seeds. 625

7. G. *pedunculata*. *R.*

Dioceous. *Leaves* oblong with parallel veins. *Flowers* terminal, long-peduncled, *male* numerous, *female* sub-solitary, with nectarial filaments united into five bodies. *Berry* ten-seeded.

Tikul or Tikoor.

A native of Rungpoor, where the tree is indigenous. The following description was taken from fresh specimens, sent from thence by Mr. Todd, who writes that the trees are high, perhaps sixty feet, and of stately growth, some young ones planted in a garden there, were in seven years, twenty feet high with a trunk, twenty-five inches in circumference, covered with bark of a spongy texture and inwardly of a flesh colour. Flowering time from January till March. The fruit ripens in April, May and June. *Leaves* opposite, short-petioled, oblong and obovate-oblong, entire, obtuse, smooth on both sides, with large and parallel veins, from six to twelve inches long. *Flowers* terminal, peduncled; *male* numerous, forming small trichomous panicles; *female* solitary, and also long-peduncled. *Bractes* opposite, one or more pairs of the divisions of the *male* panicles, and also at the base at the long proper peduncles of both male and female flowers. The *male* flowers so far as I can see are always on a separate tree. *Calyx* of two opposite pairs of nearly equal cordate smooth, concave, fleshy leaflets. *Petals* four, oblong, alternate with the leaflets of the calyx, and nearly of the same length. *Filaments* numerous, short, collected on a large elevated four-sided, fleshy receptacle. *Anthers* twin. *Pistil* no other than an abortive gland immersed in the fleshy receptacle of the stamens. *Female calyx* and *corol* as in the male. *Nectary*, or abortive stamens, a membranous ring surrounding the base of the germ, which divides into twenty or thirty, compressed filaments, ending in enlarged, glandular heads, not unlike anthers. This ring is soon split into various portions by the growth of the germ and then appears like the phalanges of filaments in the class *Polyadelphia*. *Germ* superior, globular. *Style* none. *Stigma* peltate, about ten-lobed. *Berry* large, two pounds weight each, round, smooth, when ripe of a rich yellow colour, and exceedingly acid. *Seeds* about ten, reniform, each inclosed in its own, proper, fleshy, succulent envelope, or aril, within which I always find a quantity of soft yellow resin. II. 626

The fleshy part of the fruit which covers the seeds and their proper juicy envelope, or aril, is in large quantity, of a firm texture and of a very sharp, pleasant, acid taste. It is used by the natives in their curries, and for acidulating water. If cut into slices, and dried, it retains its qualities for years and might be most advantageously employed during long sea-voyages, as a succedaneum for lemons, or limes, to put into various messes, where salt meat is employed, &c.

8. G. *paniculata*. *R.*

Dioecious. *Leaves* oblong. *Male flowers* panicled, *female* spiked, and without a nectary. *Berry* spherical, four-seeded.

This tree, found in a few gardens about Calcutta, was originally from Silhet, where the tree is indigenous, and known to the natives by the name Boobee-Kowa; about Calcutta, they are smaller than in their native soil. Flowering time the cold season; the fruit ripens in July. *Trunk* straight, *branches* more erect, and ascending; *branchlets* crowded. *Bark* pretty smooth, of a dark-brownish colour. *Leaves* opposite, decussated; short-petioled, oblong and oblong-lanceolate, entire, obtuse-pointed, or emarginate, smooth and shining on both sides; about six inches long and from two to three broad. *Male* flowers very numerous, white, collected on large brachiate panicles. *Calyx* and *corol* as in the genus. *Stamina* numerous, on an elevated, glandular, central receptacle. *Female* flowers on a distinct tree. *Spikes* termi- II. 627

Page Carey Ed. nal, short, rigid, supporting a few, generally five or seven rigidly sessile, decussate, small, pure white flowers. *Calyx* and *corol* as in the genus; no nectary. *Stamens*, rarely the rudiments of one or two may be present. *Germ* oval. *Style* none. *Stigma* large, convex, entire, dotted with glands. *Berry* round, of the size of a large cherry, when ripe yellow, succulent, and containing generally four reniform seeds, each immersed in a pulpy aril. This pulpy aril is palatable; its taste more like that of the mangosteen than any thing else I can compare it to.

9. G. *pictoria. R.*

Leaves oblong, ventricose. *Flowers* axillary, solitary, sessile. *Stigma* four-lobed. *Berry* with as far as four seeds.

This tree is a native of the highest parts of Wynaad, where the soil is a stiff whitish clay; where there is constant moisture from fogs during the dry season, and abundant rains during the wet. Flowering time, on their native soil, February; the fruit ripens in May and June. Mr. Dyer, the Surgeon at Tellicherry writes me, that many attempts have been made to rear this tree on low lands, near the coasts, but that they uniformly perish in a short time, being
II. transported from their native soil to their gardens. The same gentleman sent several small
628 plants to the Botanic garden in Bengal, and others have been reared from seed received from the same gentleman; but both sorts soon died. I have therefore much reason to think the *Arbor Zeylanica of Burm. Flor. Zeyl. p.* 27, is different, for though the fruit of both is small, and contains four seeds, yet that of Ceylon has round leaves which is by no means the case in our Wynaad tree; and I am further inclined to think that this very tree of Burman is now in this garden, at least I have several plants of one which was reared from seed, sent from Ceylon by General Macdowall, about nine years ago, under the Cingalese name *Ambul ghoorka*, they are now beautiful small trees, with polished, thick, obtuse, oval leaves; two of them have produced male flowers abundantly, and from their situation and structure I think will be a new species of *Xanthochymus.*

Tree tall say sixty feet high, of a conical shape, and very full of branches. *Bark* pretty thick, scabrous and ramous on the outside of a dark ferruginous colour, intermixed with many yellow specks, and through its substance, particularly on the inside, considerable masses of gamboge are found. *Young shoots* somewhat angular, smooth, polished, of a deep green. *Leaves* opposite, short-petioled, oblong-ventricose, rather acute, entire, smooth on both sides, and of a firm texture, from three to four inches long by one and a half or two broad. *Hermaphrodite* flowers, axillary, over the axills of the former year, solitary, sessile, of a middling size, and yellow colour. *Bractes* some very short, obscure scales, round the insertion of the flowers. *Calyx* of two unequal pairs of concave, obtuse leaflets, permanent. *Petals* four, oval, longer than the calyx. *Filaments* united into four bodies, which are again united at the base into a narrow ring, round the bottom of the young germ, above each body is divided into from two to six
II. single unequal, short filaments. *Anthers* from ten to fifteen, oblong, two-lobed, and seemingly
629 fertile. *Germ* superior, round, four-celled, with one ovulum in each attached to the axis, a little above its middle. *Style* none. *Stigma* four-lobed, permanent. *Berry* size of a large cherry, oval, smooth, very slightly marked with four lobes, crowned with the sessile, four-lobed, verrucose, permanent stigma. *Bark* leathery, pretty thick, and rather spongy, one-celled. *Seeds* four when all ripen, oblong-reniform. *Perisperm* and *embryo* as in the genus. *Male* flowers. *Calyx* and *corolla* as in the female. *Nectarium* none *Filaments* numerous, inserted on the crown of a square fleshy receptacle, in the centre of the flower, clavate, angular. *Anthers* peltate. *Pistillum* no vestige of one.

I have received frequent samples of the *Gamboge* the produce of this tree, from my good correspondent Mr. Samuel Dyer, the Surgeon at Tellicherry, and have uniformly found it even in its crude, unrefined state, superior in colour, while recent, to every other kind I have yet tried, but not so permanent as that from China.

10. G. *cornea. Willd.* 2. 819.

Dioecous. *Leaves* opposite, oblong. *Flowers* terminal; *male* many-fold; *female* solitary. *Stigma* four-lobed. *Berry* four-seeded.

Lignum corneum. *Rumph. Amb.* 3. *p.* 55. *t.* 30.

Two small, beautiful trees, one male, the other female, of about twenty years growth are found in the garden of the late Colonel Robt. Kyd, near Calcutta, said to have been originally, from one of the Malay Islands. They blossom in January and February; and the female ripens its fruit in May and June. *Trunk* straight. *Branches* opposite, many of them drooping; height of the whole trees about twenty feet. *Leaves* opposite, petioled, drooping, oblong, entire, smooth, of a deep shining green on both sides; from four to six inches long and about two broad. *Pe-*
II. *tioles* about three quarters of an inch long, round, smooth.
630 Male Flowers terminal, peduncled, from three to nine-fold, pretty large, of a pale yellow colour and without smell. *Bractes* lanceolate, caducous. *Calyx* of four roundish expanding, concave, withering leaflets. *Petals* four, nearly oval, concave, expanding, twice the size of the calyx, of a pale-yellow colour. *Stamens* very numerous, inserted on a fleshy four-lobed receptacle. *Filaments* very short, indeed scarcely any. *Anthers* sub-ovate, small, recurved. *Germ* none. *Style* four-seeded, clavate. *Stigma* a large glutinous, abortive yellow gland.

Female Flowers on a separate tree, terminal, sessile, and always solitary on our single tree. *Calyx* and *corol* as in the male. *Stamens* entirely wanting. *Germ* above, ovate, four-celled, with one ovulum in each attached to the axis. *Style* short and thick. *Stigma* large, four-lobed and covered with glutinous glands. *Berry* nearly round, of the size of a medlar, covered with a dark purple, juiceless bark, and crowned with a rugose, rather elevated stigma. *Seeds* as far as four each, enveloped in a small portion of a pleasant sub-acid, white pulp, like that of the real *Mangosteen. Perisperm*, &c. as in the other species already described.

From wounds made in the tree: or unripe fruit, there flows a yellow-juice, which soon hardens into a gum resin of a tolerably good yellow colour. In this country the plant is an exotic, of course there is no information to be procured from the natives regarding the quantity procurable, nor the uses to which it is applied in its native soil; we must therefore depend on what Rumphius says, if this be his tree. Page Carey Ed.

XANTHOCHYMUS. R.

GEN. CHAR. *Calyx* five-leaved. *Corol* five-petalled. *Nectaries* five, alternate with the five polyadelphous filaments. *Germ* from three to five-celled, one ovulum in each attached in the middle of the axis. *Berry* superior, one-celled, with from one to five seeds, each enveloped in a pulpy aril. *Embryo* simple, erect, in ample perisperm. II. 631

1. X. *dulcis. R.*

Polygamous. *Leaves* opposite oblong. *Flowers* fascicled, lateral. *Corols* globular. *Fruit* oval, obtuse, from one to five-seeded.

A native of the Molucca islands; from thence introduced into the Botanic garden at Calcutta as a species of *Mangosteen.* Flowering time in Bengal June and July. The fruit ripens about the beginning of the cool season.

The trees in the Botanic garden are but small, being only eight years old; but very handsome, and the fruit palatable. *Trunk* quite straight to the top of the tree. *Bark* smooth, olive-coloured. *Branches* and *branchlets* opposite, expanding, the latter grooved and keeled; the height of trees eight years old about ten feet. *Leaves* opposite, short-petioled, oblong, entire, often pointed; texture hard, both surfaces polished, about six inches long, and from two to three broad. *Petioles* short, transversely wrinkled at the base; on the inside a fleshy ligule, or protuberance, which is I believe common to the whole of this order (Guttifero.) *Stipules* none. *Flowers* in small fascicles, from the axills of one or two-year old branchlets, peduncled, of a middling size, or nearly globular, greenish white, inodorous. *Calyx* of from four to five or six unequal, round concave leaves, as long as the stamina, contracted into a globe, with a small opening at the apex when most expanded. *Nectary* in the *male*, a truncated porous, yellow body, with five lobes projecting between the insertion of the five filaments. In the *hermaphrodite* are five yellow porous glands, alternate with the filaments round the base of the germ. *Filaments* in both, are five incurved, broad, flat bodies divided at the apex into six, seven, or eight short portions, each of which supports a twin anther. II. 632 *Germ* in the *hermaphrodite* ovate, smooth, five-celled, with one ovulum in each, attached to the middle of the axis. *Style* scarcely any. *Stigma* five-lobed. *Berry* the size of an apple, from round to oval, obtuse, smooth, bright yellow when ripe, fleshy, the flesh or pulp in quantity, yellow, and rather sweet, one-celled. *Seeds* from one to five, oblong, rather pointed at the base on the inside, where a large, oblong, lighter coloured space marks the attachment. *Integument* single, reticulated with lighter coloured veins, on a dark cinnamon-coloured ground. *Aril* a large portion of the pulp, of rather a softer consistence, somewhat darker colour, and pleasant taste, appertains to each seed, which separates spontaneously with its seed from each other, and from the exterior, thick, fleshy covering when the fruit is perfectly ripe. This is the only edible part not only in this but also in all the species of *Garcinia. Perisperm* conform to the seed, of a hard fleshy texture and pale yellowish colour. *Embryo* simple, slender, the length of the perisperm, and scarcely to be distinigushed from it till vegetation begins, when the radicle issues from the more pointed base of the seed, and the plumula from its apex. At this stage, a vertical section shows distinctly the form of this body passing through the centre of the seed (as represented by Gærtner in his *Mangostana Cambogia. t.* 105,) into the ligneous part of the plumula and radicle, while the two extremities of the perisperm may be as clearly traced to the cortical part. When vegetation is a little more advanced a more substantial root issues from the base of plumula, as in *monocotyledonous* plants, which increases rapidly while the other from the plumula is well established, and finally perishes.

2. *X. ovalifolius. R.* II. 633

Polygamous. *Leaves* oval, polished. *Flowers* in lateral fascicles, male and female hermaphrodite mixed. *Germ* three-celled. *Berry* oval (size of a small apple) from one to three-seeded. From Ceylon the seeds of this very elegant, straight, uncommonly ramous tree, were sent by General Hay Macdowall to the Botanic garden at Calcutta, under the Cingalese name *Ambul Ghoorka*, where in from seven to ten years the trees began to blossom abundantly during the whole of the hot season, but did not produce perfectly ripe fruit until the month of July 1812, when they were fully ten years old.

3. X. *pictorius. R. Corom. pl.* 2. *N.* 196.

Leaves opposite, linear-lanceolar. *Flowers* in lateral fascicles. *Berry* ovate-pointed.

Beng. and *Hind.* Dampel.

Teling. Iwara memadee.

Cing. Rata ghorka.

A native of the mountainous districts in India. Flowers during the hot season. Fruit ripens in November and December.

This beautiful tree yields a green fruit, and a large quantity of indifferent gamboge. It is truly guttiferous, and but little removed in its natural habit, from the *Garcinias.*

BARRINGTONIA. Schreb. gen. n. 1150.

GEN. CHAR. *Calyx* simple, from two to four-cleft, permanent. *Corol* one or four-petalled,

II. 634 inserted on the short tube of the stamina. *Germ* inferior, two-celled, (4. Gært.) *cells* many seeded; *attachment* interior.* *Berry* dry, one-celled, one-seeded. *Embryo* simple, inverse, length of the ample perisperm.

1. B. *racemosa. R.*

Leaves broad-lanceolar, serrulate. *Racemes* pendulous. *Calyces* from two to three-parted. *Fruit* ovate, four-sided, with rounded angles.

Eugenia. *racemosa. Linn. sp. pl. ed. Willd.* 2. 966.

Samstravadi. *Rheed. Mal.* 4. *t.* 6.

Batonica *sylvestris alba. Rumph. Amb.* 3. *t.* 116.

A stout timber tree, a native of the Molucca Islands, the Delta of the Ganges, Malabar, &c. In the Botanic garden it blossoms during the cool season, and the seed takes above half a year to ripen. *Trunk* pretty straight. *Branches*, numerous and spreading much. *Bark* on the younger part, a dark ash-colour; on the older scabrous, and darker coloured. *Leaves* alternate, short-petioled, broad-lanceolar, acuminate, serrulate or crenulate; smooth on both sides; from three to twelve inches long, and from one to four broad. *Racemes* sometimes terminal, sometimes from the large branches, pendulous, coloured and smooth. *Flowers* remote, short-pedicelled, large, pale pink. *Bractes* minute, caducous. *Calyx* superior, two or three-parted, smooth, permanent. *Petals* four, inserted on the base of the short tube which is formed by the base of the filaments united, and dropping off with them in one body, oblong, smooth, margins revolute. *Filaments* numerous, longer than the petals. *Germ* inferior, turbinate, two-celled, with several ovula in each attached to the middle of the partition, as in *Eugenia. Style* longer than the stamina. *Stigma* simple. *Fruit* drupaceous, of the size of a large pullet's egg, and not unlike one in shape, only somewhat four-sided, pretty smooth on the outside, olive green within, the flesh rather spongy and brown, one-celled. *Seed* solitary, ovate-oblong. *Integu-*

II. 635 *ments* scarcely any other than the smooth, dark brown surface of the cell of the pericarpium. *Perisperm* conform to the seed, firm, fleshy and white. *Embryo* simple, (as in the *Guttiferous* seeds) lanceolate, length of the perisperm, inverse; when vegetation begins, the *plumula* issues from the base of the fruit, and this part (the simple embryo) forms the ligneous centre of the shoots, while the perisperm furnishes the cortical part and the leaves. *Radicle* superior, (that is, from the apex of the perisperm and embryo, as the plumula is from the base) no appearance of any other cotyledon or cotyledons than the perisperm and embryo. The seeds of *Barringtonia acutangala* have exactly the same conformation. In neither have I observed anything that can be called a cotyledon except the copious perisperm which performs the same office, for by the elongation of its two extremities, it furnishes the bark and foliage of the young plant, while the opposite end of the *embryo* or central part supplies the wood and pith; it is exactly the same in the several species of *Garcinia* and *Xanthochymus* examined by me, only there the central portion, which I call the embryo, is very slender, and the permanent root proceeds from the base of the plumula as in the plants usually called *monocotyledonous* while that from the opposite end of the embryo soon perishes, or remains slender compared to the other.

2. B. *acutangula. R.*

Leaves cuneate-obovate, serrulate. *Racemes* pendulous. *Calyx* four-parted. *Fruit* oblong, four-sided, with the angles sharp.

Tsjeria samstravadi. *Rheed. Mal.* 4. *t.* 7.

Eugenia *acutangula. Linn. sp. pl. ed. Willd.* 2. 966.

Stravidium. *Juss. gen. pl.* 361.

Ijul, the Sanscrit name.

Beng. Hijjul.

II. Meteorus *coccineus. Lourier Cochin Ch.* 499.

636 Butonica terrestris rubra. *Rumph. Amb.* 3. *t.* 115.

Teling. Cadamic.

This species is common in most parts of India; it grows to be a large handsome tree, in appearance it is more like a regular, well-shaped, middle-sized Oak, than any other tree I have ever met with. It flowers about the beginning of the wet season. Its long pendulous racemes, of scarlet-coloured flowers, give it at that time a most elegant appearance. *Bark* dark-coloured, scabrous, tough and thick.

3. B. *speciosa. Willd.* 3. 845.

Leaves entire. *Flowers* on a terminal thyrse. *Fruit* pyramidally four-sided.

Butonica. *Rumph. Amb.* 3. *t.* 114.

Commersonia *sonnerat. Guin.* 14. *t.* 8. 9.

A large, and beautiful tree, a native of the Malay Archipelago and the South-Sea Islands.

CAREYA. R.

Gen. Char. *Calyx* four-parted. *Corol* four-parted. *Stamina* icosandrous, exterior and interior filaments abortive. *Germ* inferior, semiquadrilocular; *ovula* numerous; *attachment* sub-interior, *Style* single. *Berry* many-seeded. *Seeds* nidulant. *Embryo* simple, length of the ample perisperm.

1. C. *sphærica. R.*

* Or it may be called one-petalled, and the stamina inserted on the short tube of the corol, as in *Eugenia* the germ has two cells, with many ovula in each, and exactly as in the real *Guttiferæ*, the embryo is perfectly simple (monocotylodonous) and furnished with an ample perisperm.

Arboreous. *Leaves* obovate, obtuse, glossy. *Berries* globular and crowned with the inflected flattened segments of the calyx. Page Carey Ed.

A large tree, a native of the mountains of Chittagong. Flowering in April; the fruit ripens in July. The leaves are deciduous just before the flowers expand, and appear with or immediately after them. *Trunk* straight, in young trees, thirteen years old, about twelve feet to the branches and twenty-four inches in circumference, four feet from the ground. *Branches* scattered, and dividing without order. *Bark* pretty smooth, ash-coloured, and abounding with very strong fibres, fit for cordage; whole height of the young trees about thirty feet. *Leaves* alternate, approximate about the ends of the branches, short-petioled, obovate-oblong, firm and glossy, obtuse-pointed, slightly-crenulate, from eight to twelve inches long, and from four to seven broad. *Stipules* none. *Spikes* or *heads* terminal, sub-globular. *Flowers* large, sessile, crowded, from six to twelve together from the spike or head, expanding in succession at night, and dropping soon after sun-rise, inodorous. *Bractes* tern, embracing the base of the germ on the outside, ovate, smooth. *Calyx* superior, four, rarely five-parted, smooth, permanent; segments semilunar, firm, and fleshy. *Petals* four, rarely five, oblong, obtuse, expanding, of a pale greenish yellow; soon after expansion the margins become so much rolled back, as to make them appear sharp-pointed, inserted into a hollow rim round the crown of the germ, within the base of the calyx. *Filaments* numerous, all united into one thick, fleshy ring near the base, and inserted within the petals, into the same ring, naturally dividing into three sorts, the *first* or *innermost*, short and converging round the lower part of the style, these are abortive; the *second* nearly as long as the petals, and fertile; the *third* as long as the petals, of a pretty deep red colour and abortive also. *Anthers* small, and attached to the second, or middle range of filaments only. *Germ* inferior, semiquadrilocular. *Receptacles* four, parietal two-lobed, meeting below in the centre (the body of the receptacle being there exactly rectangular,) though receding in the upper part; hence four-celled below, and one-celled above. *Ovula* numerous and arranged in six vertical rows in each cell. In the other arboreous species (C. *arborea*) there are only two rows in each cell. *Style* the length of the stamens. *Stigma* obscurely four-lobed. *Berry* spherical, smooth, of the size of an orange, the whole substance, the seeds excepted, of a firm, yellowish fleshy consistence, intermixed with a few fibres. *Seeds* a few scattered through the pulp of the berry, shape various but generally oblong, and about the size of a field bean. *Integument* single, tough, smooth, of a light-brown. *Perisperm* conform to the seed, hard, amygdaline. *Embryo* simple, (as in the *Guttiferous* seeds) lanceolate, extending the whole length of the seed. When vegetation commences the radicle issues from the small end of the seed, close to the umbilicus; and the scaly plumula from the opposite end; the embryo furnishing the centre, or ligneous part, and the perisperm the cortical part of the young plant. II. 637 II. 638

2. C. *arborea. R. Ind. pl.* 3. *N.* 218.

Arboreous. *Flowers* sessile. *Leaves* oval, serrulate dentate. *Berries* ovate and crowned with the erect segments of the calyx.

Pelou. *Rheed. Mal.* 3. *t.* 36.

Teling. Kumbi.

Tam. Pootta-tanni-marum.

A tree of immense size, growing on the mountains of Coromandel, &c. where it blossoms during the hot season, and the seed ripens about three or four months after.

3. C. *herbaceous. R. Ind. pl.* 3. *n.* 217.

Herbaceous. *Flowers* peduncled. *Leaves* obovate-cuneate, serrulate.

Bhoomi darimba the Sanscrit name.

Beng. Bhooi dalim.

A small herbaceous plant, with a ligneous, permanent root, which shoot from short, perishable stems, or branches of only a few inches in length; a native of the interior parts of Bengal, where it was found by Dr. William Carey, whose name the genus bears. Its numerous, very large beautiful pink flowers appear in February and March and the seed ripens in June and July. II. 639

BERRIA. R.

Ger. Char. *Calyx* five-parted. *Corol* five-petalled. *Germ* superior, three-celled; *cells* many-seeded; *attachment* anterior. *Capsule* three-seeded, three-valved, six-winged. *Seeds* a few in each cell. *Embryo* inverse and furnished with a perisperm.

B. *Amomnilla. R.**

Cing. Ammonilla.

Eng. Trincomalee wood tree.

A native of Ceylon and one of their largest and most useful timber trees. Much of the wood is annually exported from Trincomalee. Trunk in young trees in the Botanic garden at Calcutta, straight with smooth, light brown bark, and an extensive, very dense, shady head. *Leaves* alternate, petioled, cordate, sometimes slightly scolloped, from five to seven-nerved, acute, smooth on both sides, from four to eight inches long. *Petioles* rather shorter than the leaves, slender, round, smooth, and often coloured. *Stipules* ensiform. *Panicles* terminal, and axillary, large, ramose, bearing numerous, elegant, middle-sized white flowers. *Calyx* one-leaved, downy, on the outside splitting irregularly into three, four, or five segments, permanent.

* This Dr. R. is inclined to consider a perfectly distinct, and well marked, hitherto undescribed genus, which he proposes to call after Dr. Andrew Berry of Madras, an eminent Physician and Botanist, to whose abilities and industry, the Botanic garden at Calcutta is much indebted. It appears to belong to Jussieu's natural order, *Malvaceæ*.

II. 640 *Petals* five-spreading, linear-oblong, double the length of the calyx or more. *Filaments* numerous, half the length of the petals. *Anthers* incumbent, two-lobed, of a bright yellow. *Germ* superior, hairy, ovate, three-lobed, three-celled, with about six or eight ovula in each, attached in two vertical rows to the axis. *Style* short. *Stigma* three-cleft.

Capsules six-winged, round, three-celled, three-valved, each valve ornamented with two large oblong, membranaceous, reticulated, expanding villous wings. *Seeds* from one to four in each cell, irregularly ovate, clothed with much stiff, light-brown, short hair, affixed to the central receptacle near its apex. The hair very readily enters the skin and produces as much painful itching as that of *Carpopogon pruriens (Dolichos pruriens Linn.) Integuments* three, the exterior one friable, light-brown; the second tough, smooth and darker coloured; the inner one a membrane adhering to the perisperm. *Perisperm* conform to the seed, amygdaline. *Embryo* inverse, of a pale yellow. *Cotyledons* roundish, from five to seven-nerved. *Plumula* two-lobed. *Radicle* oblong, superior, with its point immediately within the umbillicus.

HUMEA. R.

Gen. Char. *Calyx* simple, five-parted. *Corol* five-petalled. *Nectary* five-leaved between the germ and numerous stamina. *Germ* superior, five-celled; *cells* two-seeded. *Style* and stigma simple. *Capsules* as far as five, one-celled, two-valved. *Seeds* one or two. *Embryo* erect, without a perisperm.

1. H. *elata. R.*

Mas-jot the vernacular name at Chittagong, where the tree is indigenous and grows to a very great size particularly in the back part of that province. Flowering time the month of May; the seed ripens in October, November and December.

II. 641 *Note.* This truly majestic tree, appears to constitute a new genus in the class *Polyandria,* and order *Monogynia* of *Linnæus,* and many stand between *Pterospermum* and *Sterculia* in Jussieu's natural order *Malvaceæ,* and as the plant named by Dr. Edward Smith, in honour of the late Lady Amelia Hume, had somewhat earlier been described and published in France, under the name *Colomeria,** consequently if that name was prior to Dr. Smith's, it must have the preference on that account. Dr. R. takes the liberty of consecrating this genus to the memory of that most amiable lady, by whose death Botany has lost one of its greatest admirers and best benefactors.

Trunk straight and of a great size; that of full grown trees in their native soil about fifteen feet in circumference four feet above the root. *Branches* numerous, spreading, forming a very large, ovate, shady head. *Bark* of the trunk and large branches ash-coloured and smooth, that of the young parts, clothed with a little hoary pubescence. *Leaves* alternate, petioled, from three to seven-nerved, cordate, margins entire, one of the lobes into which the base is divided, generally larger than the other, upper surface smooth, hoary underneath, from four to twelve inches long, and from three to eight broad. *Petioles* swelled at each end, the rest round, and a little hoary about one-third or one-fourth the length of the leaves. *Panicles* terminal, large, ovate, very ramous; with the ramifications rather hoary. *Flowers* numerous, pedicelled, collected in little fascicles, colour bright yellow, not fragrant, but pretty large and showy. *Calyx* inferior, one-leaved, companulate; *border* four or five-toothed, hoary on the outside, smooth within. *Corol. Petals* five, in the bud contorted, when expanded obliquely
II. oblong; yellow, spreading. *Nectary* or abortive filaments five, linear, shorter than the stami-
642 na, standing between them and the germ, opposite to its five grooves. *Filaments* numerous, slender, shorter than the petals, very slightly, or rather, scarcely united at the base, and inserted round the apex of a short turbinate receptacle. *Germ* superior, and elevated on the turbinate receptacle considerably above the insertion of the *calyx* and *corol,* and very hairy, conspicuously and deeply five-lobed, five-celled, each containing two ovula attached from their middle to the inner angle of the cell. *Style* single, five-furrowed, the length of the filaments. *Stigma* simple. *Capsules* from one to five, two or three most frequent, round-oval, about an inch and a half in diameter, and one inch thick, of a firm, fibrous, woody texture, surface grey or ash-coloured, and somewhat downy, one-celled, two-valved. *Seed* one, rarely two; conform to the capsule. *Integuments* two, the exterior one light-brown and friable; the interior one membranaceous. *Perisperm* none. *Embryo* conform to the seed, erect. *Cotyledons* two, nearly equal, amygdaline. *Plumula* small, villous, two-lobed. *Radicle* oblong, inferior.

OBSERVATIONS.

An incomplete drawing and description of this very stately tree, were sent to England (with my other drawings,) in 1804, numbered 1482, under the name *Pterospermum paniculatum;* they were taken from excellent specimens in flower received from Chittagong, but unfortunately, the seed vessel of a *Pterospermum,* was no doubt brought, tied to the specimens for that of *Maus-jot,* and as such given in the above-mentioned drawing and description. This error has only been discovered during the last year (1810,) by procuring not only plants for the Botanic garden but abundance of specimens with flowers and seed vessels in all stages, from Chittagong and Silhet.

II. 643 ## *OCHNA. Schreb. gen. n.* 891.

Gen. Char. *Calyx* inferior, five-leaved. *Corol* from five to twelve-petalled. *Germ* from

* Smith's *Introduction to Phisiological and Systematical Botany, p.* 376.

five to twelve-celled, one-seeded ; *attachment* inferior. *Seeds* several, affixed to a large round- Page Carey Ed.
ish receptacle. *Embryo* erect, without perisperm.

O. *squarrosa. Willd.* 2. 1158. *Corom. pl.* 1. *p.* 62. *t.* 89.

Panicles lateral. *Leaves* oblong, finely serrate.

Kunuk-champa the Sanskrit name.

Teling. Yerra-juvee.

Japotapita *cinnamomifolia. Burm. Zeyl.* 123. *t.* 56.

A small tree, a native of the mountainous parts of India. *Leaves* deciduous in the cool season, and appearing with the sweetly fragrant flowers in February and March. The seed ripens in May and June.

ROYDSIA. R.

GEN. CHAR. *Calyx* inferior, six parted. *Corol* none. *Stamina* on a column or receptacle. *Germ* pedicelled, above the insertion of the filaments, three-celled ; *cells* many seeded ; *attachment* interior. *Drupe* pedicelled, one-seeded. *Embryo* erect, without perisperm.

This elegant, strongly marked genus is named in honour of Sir John Royds, one of the puisne Judges of the Supreme Court of Judicature of Bengal, an eminent benefactor to the science.

R. *suaveolens. R.*

Madhuvee-luta, the vernacular name in Silhet, where the plant is indigenous. Flowering II.
time the month of March, when its numerous blossoms diffuse a strong, but pleasant odour 644
through the forests, where they grow. The *seed* ripens in August and September. *Stem* stout, woody and with its numerous branches climbing over trees to a great extent. *Bark* of the young shoots green, void of pubescence, but covered with numerous, small, elevated, whitish specks. *Leaves* alternate, short petioled, oblong, entire, of a firm texture, and smooth on both sides, sometimes pointed, about six inches long, and about two and a half and three broad. *Stipules* none. *Inflorescence* terminal, and axillary, when terminal it is generally a long slender panicle, as long as the leaves ; when axillary, a simple raceme. *Flowers* numerous, alternate, short-pedicelled, pretty large, of a pale yellow, and fragrant. *Bractes* solitary, oblong, villous, one-flowered. *Calyx* inferior, one-leaved, six cleft, villous. *Segments* ovate, in a double series, the exterior three rather longer than the others. *Corol* none, nor anything like a nectarial organ. *Filaments* numerous, (about 100,) the length of the pistilum, the pedicel of which is inserted on the apex of a short column. *Anthers* incumbent. *Germ* pedicelled above the elevated receptacles of the stamina, oblong, three-celled, with about two rows of *ovula* in each, attached to the axis. *Style* very short. *Stigma* trifid. *Drupe* pedicelled, of the size of a large olive, oval, covered with a rather scabrous, oranged-coloured, thin, brittle cortex, one-celled. *Pulp* in considerable quantity, soft and yellow. *Nut* oblong ; *texture* of a ligneous nature, thin, one-celled, and three-valved. *Seeds* solitary, conform to the nut. *Integument* single, membranaceous. *Perisperm* none. *Embryo* erect. *Cotyledons* two, unequal, the larger one deeply concave, receiving the smaller one doubled into its concavity, as in *Shorea ;* they are of a firm fleshy texture, and yellowish. *Radicle* inferior, and rather within the base of the cotyledons.

POLYANDRIA TETRAGYNIA. II. 645

TETRACERA. Schreb. gen. n. 930.

GEN. CHAR. *Calyx* from four to six-leaved. *Corol* from three to six-petalled. *Filaments* dilated at top. *Anthers* twin. *Follicles* from one to four. *Seeds* arilled, one or more in each follicle.

1. T. *sarmentosa. Willd.* 2. 1240.

Shrubby, scandent. *Leaves* oval, ribbed, scabrous, serrate. *Panicles* terminal. *Flowers* monogynous. *Follicles* one-seeded.

Piripu. *Rheed. Mal.* Delima sarmentosa. *Burm. Ind.* 37. *f.* 1.

A native of Pulo Penang, Ceylon, &c. Dr. William Hunter who found it on Pulo Penang, thinks this may be Marsden's *Pulass*, see his *History of Sumatra. p.* 76.

2. T. *trigyna. R.*

Shrubby, scandent. *Leaves* broad-lanceolar, acute, serrulate. *Panicles* terminal, scanty ; *flowers* trigynous. *Corol* four-petalled. *Follicles* with several seeds in each.

Mamplas of the Malays on Pulo Penang, where it is indigenous in the forests, running up and down trees, &c. to a great extent. Flowering time uncertain. The *seed* ripens in July and August. *Leaves* alternate, short-petioled, short, broad-lanceolate, slightly serrate, having a few scattered hairs on both sides, from two to three inches long. *Stipules* none. *Panicles* terminal, small, a little hairy. *Flowers* pretty large. *Bractes* ovate-lanceolate, hairy, one or two at each of the divisions of the panicle. *Calyx* generally four-leaved ; *leaflets* unequal, round, concave, ciliate, permanent. *Petals* generally four, much longer than the calyx, deci- II.
duous. *Filaments* numerous, clavate. *Anthers* twin. *Germ* superior. *Style* recurved. *Stigma* 646
simple. *Follicles* three, polished, size of a field bean. *Seeds* several, generally from three to five, round, smooth, enveloped in a large quantity of orange-coloured wool, growing from the eye of the seed.

3. T. *Euryandra. Willd.* 2. 1242.

Shrubby, scandent. *Leaves* elliptic, scabrous, lineate, with the margins a little waved.

Page Carey Ed. *Panicles* terminal, large and ramous. *Flowers* trigynous. *Calyx* and *corol* of about seven leaflets and petals. *Germs* very hairy.

A native of the Moluccas.

POLYANDRIA PENTAGYNIA.

NIGELLA. Schreb. gen. n. 935.

Gen. Char. *Calyx* none. *Corol* five-petalled. *Nectaries* within the corol. *Capsules* five, connected.

N. *indica. R.*

Annual. *Petals* entire. *Germs* five, length of the stamina. *Leaves* decompound. *Exterior* lip of the nectaries ovate, and deeply two-cleft, interior entire and acute.

Beng. and *Hind.* Kalla-jeera.

A native of Hindoostan. It appears, flowers and ripens its seed during the dry season. Compare with N. *arvensis.*

POLYANDRIA POLYGYNIA.

NELUMBIUM. Juss.*

II. 647 Gen. Char. *Calyx* none. *Corol* inferior, many-petalled. *Germs* many, distinctly immersed in the turbinate, truncate receptacle; one-celled, one-seeded; *attachment* (of the ovula) superior. *Seeds* many, lodged as in the germ. *Embryo* inverse, without perisperm or vitellus.

N. *speciosum. Willd.* 2. 1258.

Root creeping. *Leaves* suborbicular, peltate, entire. *Peduncles* and *petioles* prickly. *Flowers* many-petalled.

Tamara. *Rheed. Mal.* 11. *t.* 30.

Padma. *Asiat. Res.* 4. 286.

Sungs. Pudma, Muhotpula.

The red variety, Ruktotpula, Kokunuda.

Beng. Rukta pudma.

Sungs. The white sort, Poondureeka, Sitambuja.

Beng. Shwet pudma.

Pers. Nilufu.

I have met with only two sorts on the coast of Coromandel, one with rose-coloured flowers, the other with flowers perfectly white, and since that time a third variety has been brought from China with smaller rosy flowers. They grow in such sweet water lakes, &c. as do not dry up during the driest season, and on the coast, flower all the year round. In Bengal they flower during the hot season, April, May and June, and ripen their seed about the close of the rains. *Root* creeping in mud, jointed at various distances, in general, fully as thick as the fore-finger, of uncertain length, but it must be very great; smooth, generally tinged with red, perforated internally with many pores. The joints in old plants are often swelled into tubulosities of various sizes; sometimes as large as a man's fist; from them issue many fungous fibres, and from the upper and the interior part of these tubulosities issue one, two, or more leaves and flowers; their insertions being surrounded with spathe-like sheaths. *Leaves* II. 648 radical, from the joints, petioled, peltate, floating on the water, transversely broad-oval, entire, except at that part which was the upper point before the leaf expanded, where it is emarginate with a point; the nerve that terminates in this point is simple and straight, all the other nerves, fifteen or thirty in number, are twice or thrice two-cleft; above, the leaf is of a beautiful pea-green colour and of a very soft velvet-like texture; underneath is a cuticle which is frequently of a turgid red, covering innumerable small vescicles, these render the leaves specifically lighter than water; the breadth of the leaves from twelve to twenty-four inches, and the length, from the emarginated point to the opposite margin, from nine to eighteen inches. *Petioles* of various length, according to the depth of the water, being always sufficiently long to admit of the leaf floating; round, rigid, as thick as a rattan, or thicker, armed with many small inoffensive prickles, and perforated with four larger and many smaller pores. *Peduncles* radical, one-flowered, of various length, round, thicker than the petioles, rigid, frequently tinged red, armed with small inoffensive prickles, and perforated with from six to seven large and many small holes. In the rose-coloured China variety, the prickles are sharper and more numerous. *Flowers* large and beautiful beyond description, particularly in the rose-coloured varieties, nearly inodorous, about nine or ten inches in diameter when expanded, they are then elevated a few inches above the surface of the water. *Calyx* none. *Corol* many-petalled (from fifteen to sixty,) the exterior ones small, and coloured, green on the outside, the middle series large, the interior lessening in size, all concave, oblong, with a minute point, lower part pale rose-coloured, deepening toward the apex. *Filaments* numerous (from two to three hundred) inserted in several series within the petals, round the base of the recep- II. tacle and about one half its length. *Anthers* linear, as long as the filaments, which elevate 649 their apices a little above the surface of the receptacle, each crowned with a most beautiful,

* Dr. Carey considers this name to be derived from two Sungskrit words, viz. *Neel*, blue; and *Umboja*, generated in water. Although we have not yet found a blue *Nelumbium* in these parts of Asia, yet it is said to be a native of both Kashmeer and Persia.

white, slightly incurved, pearl-coloured club. *Receptacle* sub-conical, from the apex from ten to thirty cells. *Germs* one in each cell of the receptacle, attached at the base, oblong, one-celled; *ovula* single, attached to a swelling at the top of the cell. *Style* scarcely any. *Stigmas* fleshy, sub-infundibuliform. *Seeds* generally as many as there were germs, oval, reniform. *Integuments* two; the exterior one spongy and spreading into lamina. *Perisperm* none. *Embryo* inverse. *Cotyledons* (*vitellus*) of Gærtner two, equal, white, united at the apex to the corol, and in some degree to each other round that organ. *Plumula* of two unequal sub-opposite, long-petioled, orbicular, peltate leaves; between them and the apex or point of union with the cotyledons is a short column, which as in *Anneslea*, I will call the peduncle. When vegetation begins, this, as well as the leaves of the plumula, and their folded petioles swell and lengthen and soon force a passage through the base of the seed, &c. as very accurately represented by Gærtner, 1. *p.* 73. 4. *t.* 19. By the time the two leaves of the plumula are expanded, the proper roots begin to appear, issuing from the base of their petioles, where they unite with the peduncle. Page Carey Ed.

In China there is a still more beautiful bright crimson variety, which they call Hung-lin, I have hitherto only seen a drawing of it.

The white Nelumbium differs in few respects from the red one, and may be considered as only a variety of it. The difference is as follows. 1st. In the white one the flowers are milk-white, in the red one rose-coloured. 2nd. In the white one the number of germs (consequently seeds) are from eight to twenty, in the red one from ten to thirty. The seeds of both come equally well to maturity and are equally fertile.

The tender shoots of the roots between the joints of both sorts are eaten by the natives, either simply boiled or in their curries. The seeds are eaten raw, roasted or boiled. The leaves are used to eat off instead of plates. These holy and beautiful plants are often met with in the religious ceremonies of the Hindoos under their Sanscrit name *Padma*. II. 650

DILLENIA. Schreb. gen. n. 939.

Gen. Char. *Calyx* five-leaved. *Corol* five-petalled. *Germ* superior, few or many, one-celled, many-seeded; *attachment* interior. *Capsules* conjoined round a conical receptacle. *Seeds* few or many immersed in a gelatinous pulp. *Embryo* centripetal, and furnished with a perisperm.

1. D. *speciosa. Thunb. in. Linn.* 1. *p.* 100. *Willd.* 2. 1251.

Leaves petioled, oblong, acutely serrate. *Flowers* solitary. *Capsules* about twenty.

Dillenia indica. *Linn. sp. pl.* 745.

Syalita. *Rheed. Mal.* 3. *t.* 38. 39.

Beng. Chalta.

Teling. Uva-chitta, the name of the tree, and Uva-kay, the fruit.

This when in flower is one of the most beautiful trees I have ever seen; it is a native of the vallies, far up amongst the Circar mountains; is also found cultivated in some gardens on account of its elegant appearance. It flowers during the hot season, and the beginning of the rains, and the seed ripens in February. *Trunk* very straight but of no great height. *Branches* numerous, spreading, then ascending so as to form a most regular round, dense, shady head, particularly while the tree is young. *Leaves* about the extremities of the branchlets approximated, short-petioled, oblong, most regularly sharp serrate, very firm, with many large, elevated, parallel veins, corresponding in number with, and ending in the points of the serratures, smooth, about nine inches long by four broad. *Petioles* about an inch long, channelled, embracing half the circumference of the branchlets, leaving a permanent mark after they fall. *Peduncles* generally one amongst the leaves that surround the extremity of each branchlet undivided, clavate, round, smooth, one-flowered. *Flowers* looking down the earth finally, delightfully fragrant, very large, about nine inches in diameter. *Calyx* five-leaved, roundish, concave, thick and fleshy, enlarging with the capsule, which it permanently encloses. *Petals* five, oblong, waved, spreading, white. *Filaments* short, very numerous. *Anthers* numerous, linear, the inner series longer and larger, bending out under the stigmas and forming a large yellow globe in the centre, which is elegantly crowned with the white lanceolate, spreading stigma opening by two pores at the top. *Style* scarcely any. *Stigmas* linear, lanceolate, recurved. *Capsules* about twenty, surrounding the large, conic receptacle, sub-reniform, soft, fleshy, pale green, one-celled, evalvular, containing a pellucid glutinous liquid which surrounds the seeds. *Germs*, about twenty, surrounding a thick, firm, conic receptacle: singly linear, one-celled, containing numerous ovula in several rows attached to a two-lobed receptacle in the inner angle of each cell. *Seeds* numerous, reniform or obliquely oval, attached as in the germ, very hairy. *Integuments* two, the *exterior* one rather thick and hard, the *inner* one membranaceous, and adhering to the perisperm. *Perisperm* conform to the seed. *Embryo* small, lodged immediately within the umbilicus. *Cotyledons* two, small. *Radicle* oblong, centripetal. II. 651

This fleshy leaflets of the calyx when the fruit is full grown have an agreeably acid taste, and are much used by the natives where the trees grow, in their curries. They make a tolerably pleasant jelly. The wood is both hard and tough; and used to make gun-stocks.

2. D. *pentagyna. R. Corom. pl.* 1. *p.* 21. *t.* 20. II. 652

Leaves petioled, broad-lanceolate, acutely serrate. *Peduncles* one-flowered, lateral, fascicled. *Capsules* five.

Teling. Rowadan.

This is a large timber tree, a native of the Northern Circars; it flowers in March and April.

Page Carey Ed.

3. D. *repanda. R.*

Leaves oval, retuse, repand, smooth; *racemes* leaf-opposed, from five to seven-flowered. *Calyx* villous on the outside.

A native of Hindoostan.

4. D. *augusta. R.*

Leaves stem-clasping, broad-lanceolar, parallel-veined, acutely serrate towards the base, the rest repand, dentate.

An immense tree, a native of the mountainous countries on the eastern frontier of Bengal. The leaves on the young trees in the Botanic garden at Calcutta, are from two to four feet long, and from nine to eighteen inches broad; while young beautifully coloured, and then somewhat villous, they taper most toward their insertion, and there embrace the branchlet with a ruffle-like waved continuation of the leaf.

5. D. *pilosa. R.*

Leaves sessile, lanceolarly cuneiform, hairy, serratures subulate, and hairy.

A majestic timber tree, a native of the mountainous countries in the vicinity of Goalpara, on the banks of the river Megna. From thence plants have been introduced into the Botanic garden at Calcutta, where they grow freely, but have not yet blossomed; the *leaves*
II. in our young trees are from twelve to nineteen inches long, and from four to nine broad; in
653 the larger leaves the serratures become more remote scallop-dentate, they are finely pointed and hairy on both surfaces, as well as round the margin.

6. D. *scabrella. R.*

Leaves petioled, cuneate, lanceolar, acutely serrate, ribbed, both sides harsh with short hairs.

A stately timber tree, a native of the mountains on the eastern frontier of Bengal.

LIRIODENDRON. Schreb. gen. n. 942.

Gen. Char. *Calyx* three-leaved. *Petals* nine. *Germs* numerous, one-celled, two-seeded; *attachment* interior, many imbricated so as to form a strobile, winged, one-celled, from one to two-seeded. *Embryo* centripetal, with ample perisperm.

1. L. *grandiflora. R.*

Leaves oblong, with a tapering base, entire. *Flowers* terminal, solitary; *calyx* of several deciduous spathes. *Corol* nine-petalled, the exterior ones green on the outside.

Doolee champa, the vernacular name in Silhet.

A middling sized, very ramous tree, a native of the hilly countries in the vicinity of Silhet and Chittagong, where it blossoms in April and May, and perfumes the air to a considerable distance with the fragrance of its fine large flowers; the seed ripens in October and November. *Young shoots* strongly marked with the annular marks left by the stipules, otherwise smooth. *Leaves* alternate, oblong, tapering most to the base, entire, hard, and void of pubescence, but glaucous, particularly underneath, obtuse, ribbed with large, simple, expand-
II. ing veins, between which the small ones are beautifully reticulated, from six to eight inches
654 long, and from three to nine broad. *Stipules* solitary, sheathing attached to one side of the edges of the petioles of the next inferior leaf. *Flowers* terminal, solitary, large, as in Miller's figure of *Magnolia grandiflora*, and like them white and fragrant. *Calyx* what I consider to be it, or an *involucre* on the many spathes which cover the flower bud, and drop off in succession, as it swells, leaving strong annular marks behind. *Petals* nine, oval, thick, firm, and fleshy, with thin waved edges, the exterior three or four green, on the outside, all the rest white. *Stamina* numerous, imbricated upwards, linear, incurved, having on each side a polliniferous groove to within a very little of the base. *Germs* numerous, imbricated upward into a cone, swelled at the base, one-celled, and containing two ovula attached to the inner angle or side of the cell; upper part (style,) free, ensiform, and villous. *Stigma* simple.

Fructification as described by Gærtner *de fruct.* 2. *p.* 475. an oblong strobiliform cone, of about sixteen inches in length, and from seven to eight in circumference, upwardly imbricated, with numerous long-tailed, folicular samara, which open on the outside near the base, and expose to view the large beautiful orange-coloured seeds, often hanging by a slender, soft, sericeous filament. *Seeds* one or two, sub-triangular; *angles* rounded. *Integuments* three, the exterior one fleshy, and while fresh of a fine glossy orange colour, the second of a reniform texture, dividing into two valves, when vegetation begins, the inner one a fine membrane. *Perisperm* conform to the seed, soft and oily. *Embryo* small, lodged in that angle of the perisperm next the umbilicus. *Cotyledons* cordate. *Radicle* oval, centripetal.

2. L. *Lilifera. Willd.* 2. 1255.

Leaves broad-lanceolate, entire, smooth.

Beng. Anoa-chumpa.

A pretty large tree, a native of the hilly countries in the vicinity of Silhet.

II.
655

MAGNOLIA. Schreb. gen. n. 942.

Gen. Char. *Calyx* three-leaved. *Corol* nine petalled. *Germs* numerous, one-celled, two-seeded, attachment interior. *Capsules* two-valved. *Seed* berried, pendulous.

1. M. *pumila. Bot. Repos. N.* 226.

Shrubby, erect, smooth. *Leaves* broad-lanceolar, entire. *Peduncles* terminal, solitary, one-flowered. *Petals* six, concave and fleshy.

A native of China. *Flower* pure white, and exquisitely fragrant. Compare with Loureiro's

Liriodendron Coco. p. 424. In the Botanic garden at Calcutta it is in blossom all the year, but has never produced even half grown fruit. The genus is therefore doubtful. Page Carey Ed.

2. M. *obovata. Willd.* 2. 1257.

Shrubby, erect, twiggy. *Leaves* oblong, entire, smooth. *Peduncles* terminal, solitary, one-flowered. *Petals* six, expanding.

A native of China; it blossoms during the rainy season in the Botanic garden. *Flowers* very large, rose-coloured, and inodorous, like *pumila* it never produces fruit in Bengal.

3. M. *fuscata. Bot. Repos. N.* 229.

Shrubby, very ramous. *Leaves* oblong, ventricose, obtuse, smooth. *Flowers* axillary, solitary. *Calyx* spathaceous, petals six, lanceolar.

A very ramous middling sized shrub, a native of China. In the Botanic garden at Calcutta it blossoms in March. The flowers are rather small for a *Magnolia*, of a very pale yellow, or cream-colour, and exquisitely fragrant; it has never produced fruit in Bengal.

MICHELIA. Schreb. gen. n. 943.

II. 656

Gen. Char. *Spathe* one-leaved, deciduous. *Corol* many-petalled. *Germ* numerous, one-celled, few-seeded; *attachment* interior. *Capsules* numerous, few-seeded. *Embryo* centripetal, furnished with a perisperm.

1. M. *Champaca. Willd.* 2. 1260.

Leaves lanceolate, round, smooth, entire. *Flowers* axillary, solitary, short-peduncled.

Champaca. *Rheed. Mal.* 1. *t.* 19.

Sampaca. *Rumph. Amb.* 2. *t.* 67 and 68.

Beng. Champaka, or Chumpa.

Sans. Champaca. See *Asiat. Res.* 4. 287.

A pretty large tree, common in gardens over most parts of India. Flowering time the rainy season; the seed ripens in the cold season. *Trunk* straight; *branches* ascending and spreading. *Leaves* alternate, round the extremities of the branchlet, petioled, lanceolate, waved, smooth, entire, from four to six inches long. *Petioles* marked on the upper margins with the cicatrices of the stipules. *Stipules* spathiform, adjoined to the petioles, caducous. *Peduncles* axillary, short, thick, one-flowered. *Flowers* large, yellow, delightfully fragrant. *Bractes* several, below the calyx, like it, but smaller, also caducous. *Calyx* a conical, leathery sheath bursting on one side, and falling off before the flowers expand. *Petals* from twelve to twenty, lanceolate, the exterior largest. *Filaments* subulate, inserted into the receptacle below the germs. *Anthers*, two, growing on the inside of each filament. *Germs* numerous, forming an imbricated cone, semi-ovate, furrowed on the outside, one-celled, with from four to twelve ovula in two vertical rows attached to the inner angle of the cell. *Style* and *stigma* from a short recurvate, ragged, glandular, yellow body. II.

Capsules many, sessile, distinct, oblong, obtuse, arranged round the lengthened receptacle, of the size of the first joint of the little finger, scabrous, straw-coloured, brown when dry, one-celled, two-valved; *valves* thick and firm. *Seeds* from one to twelve, attached as in the germ, various in shape, of the size of a pea. *Integuments* three; the exterior one thick, fleshy and flesh-coloured; the second hard, irregularly furrowed, of a dark-brownish black; and the inner one membranous. *Perisperm*, conform to the seed, while fresh succulent. *Embryo* small, sub-cylindric, lodged close to the umbilicus. *Cotyledons* oblong. *Radicle* ovate, pointing to the umbilicus (centripetal.) 657

ANNONA. Schreb. gen. n. 945.

Gen. Char. *Calyx* three-leaved. *Corol* six-petalled. *Germs* numerous, one-celled, one-seeded; *attachment* inferior. *Fruit* compound, many-seeded. *Embryo* amply furnished with a perisperm.

1. A. *squamosa. Willd.* 2. 1265.

Leaves narrow, oblong, obtuse, smooth. *Fruit* ovate, obtuse, squamose. *Exterior petals* lanceolate and obtuse; the *inner* scarcely any.

Beng. Ata.

Atamarum. *Rheed. Mal.* 3. *t.* 29.

Eng. Custard-apple.

Cultivated; where indigenous uncertain, it flowers during the early part of the hot season; the fruit ripens in July, August and September.

2. A. *reticulata. Willd.* 2. 1265.

Leaves oblong, lanceolate, somewhat acute, smooth. *Fruit* ovate, lanceolate and obtuse.

Beng. Noona.

Anona marum. *Rheed. Mal.* 3, *t.* 30, *and.* 31. II.

Is said to be indigenous amongst the mountains immediately east of Bengal, and universally cultivated over India. 658

I strongly suspect Louriero's A. *asiatica* is this very tree.

UVARIA. Schreb. gen. n. 944.

Gen. Char. *Calyx* three-leaved. *Corol* six-petalled. *Germs* many, one-celled, seeds one or many; *attachment* interior. *Berries* many, pedicelled on a common receptacle, one or more seeded. *Embryo* centripetal, and furnished with ample perisperm.

1. U. *ventricosa. R.*

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Arboreous, with a straight trunk and diverging branches. *Leaves* ovate, lanceolate, entire, shining. *Fascicles* leaf-opposed, many-flowered. *Calyx* minute. *Petals* equal, the inner three pitcher-shaped. *Berries* oval, from six to seven-seeded.

This elegant tree is a native of the eastern hilly and mountainous provinces of Bengal, from Tippera it was introduced by Mr. Stephen Harris into the Botanic garden, where it blossoms in March and ripens its seed in July. *Trunk,* in trees of eight or ten years' growth, thick as a man's thigh, perfectly erect, and straight, covered with smooth, ash-coloured bark. *Branches* numerous, diverging, with apices somewhat curved up. Height of the young trees twenty-five or thirty feet. *Leaves* alternate, bifarious, short-petioled, broad, ovate-lanceolate, entire, taper, obtuse-pointed, recurvate, or drooping, of a very firm texture, and shining, from four to eight inches long, and from one to three broad. *Peduncles,* or rather, fascicles solitary, nearly leaf-opposed, very short, generally bearing from ten to fifteen, long-pedicelled, somewhat drooping, pitcher-shaped, greenish white, fragrant flowers, which expand in succes-
II. sion. *Bractes* ovate, solitary at the base of each pedicel, with a smaller one near the middle.
659 *Calyx* of three small, triangular, brownish leaflets. *Petals* equal, ovate, cordate, acute, the exterior three revolute, the inner three converging, and forming a conic dome over the genitalia, with the only apices recurvate, villous on the outside. *Germs* ten or twelve, nearly linear, incurvate, one-celled, containing two vertical rows of ovula vertically attached to the the inner angle of the cell. *Style* short. *Stigmas* somewhat capitate. *Berries* from four to eight, short-pedicelled, ovate, smooth, of the size of a pullet's egg, yellow. *Seeds* six or seven, placed in a double order, and separated from each other by a considerable portion of pulp. *Shape* various, but always more or less oval, or oblong, much flattened on both sides. *Integuments* single, brown and pretty smooth, sub-ligneous, and thick, particularly round the margins. *Perisperm* conform to the seed, of a pale colour and horny texture, deeply intersected with numerous brown, hard fibres, which project from the hard integuments of the seed. *Embryo* small, straight. *Cotyledons* ovate-oblong. *Radicle* oblong, immediately within the umbilicus and pointing to it.

2. U. *dioeca. R.*

Shrubby. *Leaves* from lanceolate to oblong, acuminate, smooth. *Peduncles* lateral, two-flowered. *Calyx* six-leaved. *Corol* three-petalled. *Berries* fusiform, one-seeded.

Tusbee, is the vernacular name in Silhet, where the shrub is indigenous. It flowers in April and May, and the seed ripens in September. *Trunk* short, soon dividing into many branches and bifarious villous branchlets. *Leaves* short-petioled, bifarious, from lanceolate to oblong, entire, smooth, except while very young, taper-pointed, from three to six inches long, and from one to two broad. *Peduncles* lateral, and generally below the leaves, two together,
II. or bifid, villous, about an inch long. *Bractes* lanceolate, villous. *Flowers* of a middling size,
660 drooping. On some shrubs I could discover only male, and on others only female, but in size and colour the same. *Male calyx* in this species must be described to consist of three, ovate, equal, lanceolate leaflets. *Petals* six, nearly adhering to each other from the middle downwards, resembling a monopetalous corol, hairy, much longer than the calyx, red. *Stamina* numerous, covering the whole sub-globular receptacle. *Filaments* scarcely any. *Anthers* turbinate, with a polleniferous groove on each side. *Germs* none. *Female calyx* and *corol* as in the male. *Stamina* none. *Germs* numerous, covering the whole of the receptacle, hairy, one-celled; and containing one ovula, attached to the bottom of the cell. *Style* short. *Stigma* recurved, large and obtuse. *Berries* numerous, long-pedicelled, of the size of a pea, smooth, one-celled; *seed* solitary. *Perisperm* round, conform to the seed, deeply penetrated with brown fissures, with the small, straight embryo, lodged in its base, close to the umbilicus.

3. U. *bracteata. R.*

Scandent, twigs villous. *Leaves* from lanceolate to oblong, villous. *Peduncles* between the leaves two-flowered, amply bracted. *Calyx* three-parted. *Petals* six, oval and nearly equal, *Berries* oval, of the size of a pullet's egg.

Jupa-bun Kula is the vernacular name in Silhet where it is indigenous; flowers in May, and the fruit ripens in September, and is then very inviting to the eye. *Trunk* and *branches* climbing over trees to a very considerable extent; the *young shoots* are round and very downy. *Leaves* bifarious, alternate, short-petioled, from lanceolate to oblong, entire, downy, particularly while young, from four to eight inches long, and two to three broad. *Peduncles* lateral, between the leaves, very downy, bifid, two-flowered. *Flowers* small, of a pale yellowish white,
II. drooping. *Bractes* large and downy, one at the division of the common short peduncle and
661 one on each pedicel. *Calyx* three-parted. *Segments* sub-orbicular, downy. *Petals* six, much larger than the calyx, nearly equal, oval, concave. *Filaments* numerous, short. *Anthers,* a groove on each side of the filaments. *Germs* many, in the disk, surrounded with the stamina, linear, downy, one-celled; *ovula* many, in two rows; *attached* to the inside of the cell. *Style* scarcely any. *Stigma* bidentate. *Berries* few, pendulous, of the size of a small pullet's egg, from oval to oblong, obtuse at both ends, smooth, when ripe of a rich yellow. *Seeds* a few, oval, compressed, smooth, rather longer than those of the common *Tamarind,* and of the same colour, and appearance. *Perisperm* and *embryo* as in the genus.

4. U. *odorata. Willd.* 2. *p.* 1262.

Leaves ovate-lanceolate, waved. *Peduncle* three-flowered, drooping. *Petals* equal, linear, acute, very long.

Cananga. *Rumph. Amb.* 2. 195. *t.* 65.

A native of the Malay Islands, and east of the Bay of Bengal. From Sumatra it was introduced into the Botanic garden at Calcutta in 1797, the largest of them, now 1809, has a trunk thirty-six inches in circumference, four feet above ground, and rather tall in proportion,

it flowers and ripens its seed at various times of the year. *Trunk* straight throughout. *Bark* smooth, ash-coloured. *Branches* from patent to diverging. *Young shoots* round and smooth. *Leaves* alternate, bifarious, short-petioled, drooping, ovate-lanceolate, acuminate, with the margins entire but waved, smooth on both sides, from four to eight inches long, and from two to four broad. *Stipules* none. *Flowers* in small fascicles of generally three, on very short peduncles from the buds of the shoots of the former year's growth, large, drooping, of a pale yellow, odorous. *Pedicels* pretty long, recurvate, villous. *Bractes* a few, small, recurvate on the short peduncles and base of the pedicels. *Calyx* of three triangular, obtuse divisions united at the base, yellow. *Filaments* shorter than the germs, each headed with a large, roundish, subulate, pointed gland. *Anthers* a groove on each side below the heads. *Germ* many, sessile, linear, one-celled, with two vertical rows of ovula therein attached to the inner angle. *Styles* scarcely any. The *stigmas*, are so firmly united into one solid, hemispheric, glandular body that they cannot be separated. *Berries* about a dozen on pretty long pedicels, from a hemispheric umbel, singly oblong, about the size of a small olive, smooth, when ripe black. *Seeds* from six to twelve, separated by the soft greenish pulp of the berry, flattened, ovate, or nearly so, pitted. *Perisperm* and *embryo* as in the genus. See *Gært. Sem.* 2. 155. *t.* 114.

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5. U. *fornicata. R.*

Scandent. *Leaves* cuneate-lanceolate. *Peduncles* between the leaves, one-flowered; the exterior three petals large, and lanceolate, the inner three small, and coalesced into a cone over the genitalia.

Beng. Lutamala.

A large scandent shrub, a native of Silhet, where it flowers in May and June.

6. U. *bicolor. R.*

Scandent. *Leaves* linear, oblong, acuminate, parallel-veined, a little hairy underneath. *Peduncles* one or two between and opposite to the leaves. *Petals* six, nearly equal; the exterior three, brown and hirsute, the inner three, smooth and red. *Berries* spherical, very villous, from four to eight-seeded.

A large, stout, scandent shrub, a native of Silhet; it flowers in April, and the fruit ripens during the rains.

7. U. *cordifolia. R.* II. 663

Shrubby. *Leaves* cordate, and ovate-cordate. *Peduncles* between the leaves, one-flowered; *petals* six, lanceolar, very long and sericeous.

A native of the moist vallies near Chittagong, where it grows to be a ramous shrub of about six feet in height, it blossoms in June, and the seed ripens in November.

8. U. *macrophylla. R.*

Shrubby, spreading; leaves oblong, obtusely acuminate, base cordate. *Peduncles* (knobs) leaf-opposed, short, few-flowered, flowers rotate. *Petals* equal, obovate.

Beng. Bagh-runga.

A large stout spreading shrub or small tree with long, weak, sub-scandent branchlets, which are clothed with much short, ferruginous down; the *leaves* are remarkably large, often a foot long, and six inches broad, parallel-veined, with the upper surface somewhat bullate, underneath villous. The *flowers* are of a dull reddish colour, and expand an inch and a half.

9. U. *heteroclita. R.*

Shrubby, scandent. *Leaves* ovate, oblong, acuminate. *Peduncles* axillary, one-flowered, male and female on the same or different plants. *Berries* many, sessile.

Beng. Tubee-kura.

A large scandent shrub, a native of the Garrow hills and other mountainous districts in the vicinity of Silhet, where it blossoms about the beginning of the rains and the seed ripens in October and November. *Young branchlets* smooth, glossy, green, with angles. *Leaves* alternate, petioled, oblong, and ovate-oblong, entire, except in young plants and shrubby, acutely serrulate-dentate, acuminate, smooth on both sides, from four to six inches long, and from one and a half to three broad. *Petioles* short, channelled and coloured. *Stipules* none. *Female flowers* axillary, solitary, long-peduncled. *Bractes* some scales round the base of the peduncles, one or two towards their middle. *Calyx* inferior, about eight or ten-leaved; *leaflets* unequal, roundish, concave, imbricated, smooth, caducous. *Corol* none. *Stamina* none. *Germs* numerous, in an imbricated, globular head, single, conical, containing two ovula that are attached to the inner side of the cell. *Style* scarcely any. *Stigma* short, small, and, bifid, situated where the keel ends in the upper edge of the twin apex of the germ. *Berries* numerous, sessile, on a globular, peduncled receptacle, distinct, turbinate, of the size of a red currant, and of nearly the same colour, succulent, one-celled. *Seeds* two, round, reniform, curvate, one end somewhat longer than the other. *Integuments* single, thick, and firm, of a brownish ash-colour. *Perisperm* conform to the seed, smelling spicy when cut. *Embryo* small, lodged in the small end of the perisperm. *Cotyledons* two small projections only. *Radicle* oval pointed, pointing to the end of the seed where it is lodged. *Male flowers* axillary, &c. as in the female; sometimes on a different tree. *Calyx* as in the female. *Corol* none. *Stamina* a small globular fleshy body in the centre formed by many imbricated, fleshy, sessile filaments, or bases for as many gaping, two-valved, one-celled anthers.

II. 664

10. U. *longifolia. Willd.* 2. 1263.

Leaves narrow-lanceolate, waved, smooth, shining. *Flowers* fascicled, long-pedicelled; *petals* equal, narrow, lanceolate, waved. *Berries* oval, one-seeded.

Devadari. *Asiat. Res.* 4. *p.* 288.

Hind. and *Beng.* Devadaree, or Debdaree.

Its native place uncertain. In Bengal it blossoms in February and the seed ripens during

Page Carey Ed. II. 665 the rains; the tree is large and elegant, but of slow growth, yet the wood is soft and white, and deemed of little use.

11. U. *villosa. R.*

Leaves oval, entire, villous. *Peduncles* few-flowered. Inner three petals larger and orbicular. *Berries* oval, two-seeded.

A tree of considerable size, a native of Bengal. Flowering time March and April, and the berries ripen in June and July. They are very much like black cherries.

12. U. *pilosa. R.*

Leaves oblong, entire, hairy, as are also the young shoots, petioles, and solitary one-flowered peduncles. *Calyx* hairy. *Petals* equal, smooth, and longer than the calyx.

A native of the Moluccas.

13. U. *grandiflora. R.*

Shrubby. *Leaves* cuneate-oblong, villous underneath, peduncles one-flowered. *Petals* subequal, obovate, flat. *Berries* long-peduncled, many-seeded.

A native of Sumatra, from thence introduced into the Botanic garden in 1804, and in June 1809 they blossomed for the first time. *Stem* in our young plants short, and as thick as a man's leg. *Branches* many, sub-bifarious, nearly erect, with their villous, round, extremities spreading; the height of the plants about six feet. *Leaves* alternate, bifarious, short-petioled, cuneate oblong, narrowing most towards the base and there rounded, with entire, margins and the apex rather acute, downy underneath, simple and parallel-veined, six inches long, and three broad. *Peduncles* leaf-opposed, solitary, drooping, one-flowered, villous, from one to two-jointed near the middle, and in the aril of the lower bracte a flower bud and its bracte. *Flowers* very large, flat, about three inches in diameter, of a crimson colour, gradually changing to very dark red, inodorous. *Calyx* three-parted; *divisions* ovate, veined, villous. II. 666 *Petals* six, nearly equal, the three exterior ones oval, the three inner ones obovate-oblong, all are obtuse, spread out flat; their texture is soft, thick, and slightly villous. *Stamina* numerous, forming with the pistils, a firm globe in the centre. *Filaments* cuneiform, incurved, rigid, crested.

Anthers a groove on each side of the filaments. *Germs* numerous, linear, one-celled, with rows of from ten to fifteen seeds attached to the inner side of the cell. *Style* none. *Stigmas* a clammy gland with a notch on the inside. *Berries* few, long-pedicelled, from oblong to cylindric, smooth, yellow, from one to three inches long. *Pulp* sweet and edible. *Seeds* from six to twenty, or more, crest compressed, smooth, light brown. *Perisperm* and *embryo* as in the genus. See *Gært. sem.* 2. 155. *t.* 114.

14. U. *odorotissima. R.*

Shrubby, scandent. *Leaves* lanceolate, smooth. *Tendrils* bearing solitary peduncled flowers. *Petals* equal, lanceolate, gibbous at the base. *Berries* one-seeded.

15. U. *uncata. Lour. Cochin Ch.* 4. 26.

A native of China. In the Botanic garden at Calcutta it blossoms throughout the year. It is powerfully fragrant, the odour not unlike that of very riple apples, when laid to ripen in a garret.

16. U. *lutea. Willd.* 2. 1262.

Leaves oblong, smooth, shining. *Flowers* fascicled. *Calyx* minute. *Petals* equal. *Berries* oval, about six-seeded.

Teling. Muoi.

A native of the Circar mountains. Flowering time the hot season.

17. U. *cerasoides. Willd.* 2. 1261.

Leaves broad-lanceolate, downy underneath. *Peduncles* lateral, solitary, one-flowered. II. *Calyx* and *corol* nearly equal. *Berries* one-seeded.
667 *Teling.* Doodooga.

A native of the Circar mountains; it blossoms during the hot season; the *seed* ripens in July.

18. U. *suberosa. Willd.* 2. 1251. *R. Corom. pl. p.* 31.

Leaves oblong, waved, smooth on both sides. *Peduncles* solitary, one-flowered. *Exterior* three petals and calyx small. *Berries* one-seeded.

Teling. Chilka doodooga.

Beng. Bura-chalee.

A native of various parts of India, in flower and fruit the whole year round.

19. U. *tomentosa. Willd.* 2. 1262. *R. Corom. pl.* 1. *p.* 31. *N.* 35.

Leaves oblong, downy on both sides. *Peduncles* solitary, one-flowered; *exterior petals* minute as the calyx, and narrow-lanceolate. *Berries* oval, about four-seeded.

A native of the Circar mountains, where it blossoms during the hot season.

20. U. *tripetala. R.*

Leaves broad-lanceolate, smooth. *Flowers* three-petalled; petals lanceolate, fleshy.

A native of the Molucca Islands. In the Botanic garden at Calcutta it blossoms in April and September.

21. U. *axillaris. R.*

Leaves narrow-oblong; *base* rounded, entire. *Peduncles* axillary, many-flowered. All the six petals linear and equal. A native of the Isle of France, where it was found by Col. Hardwicke in flower in June and July.

II. 22. U. *nitida. R.*
668 *Leaves* broad-lanceolate, entire, polished. *Peduncles* axillary, many-flowered. *Calyx* minute. *Petals* unequal, the inner three cuneiform. *Berries* sub-sessile, one-seeded.

A native of the Moluccas.

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UNONA. Schreb. gen. n. 947.

Gen. Char. *Calyx* three-leaved. *Corol* three, four, or six-petalled. *Germs* many, one-celled, few-seeded; *attachment* interior. *Berries* many, necklace-shaped. *Embryo* erect, and amply furnished with a perisperm.

1. U. *longiflora. R.*

Leaves linear-oblong. *Flowers* from two to three-petalled, of great length and pendulous. *Joints* of the berries few and linear oblong.

Kulla-kura the vernacular name in Silhet, where it is indigenous; grows to the size of a large shrub or small bushy tree, flowers in April and May, and the seed ripens about the close of the rains. *Young shoots* quite smooth, round, and flexuous. *Leaves* alternate, bifarious, short-petioled, linear-oblong, entire, smooth on both sides, and particularly glaucous underneath, from six to twelve inches long, and from two to four broad. *Peduncles* axillary, solitary, from three to ten inches long, filiform, smooth, one-flowered. *Flowers* uncommonly long, pendulous; yellow on the outside, bright orange on the inside. *Calyx* three-leaved; *leaflets* reniform, cordate, acuminate, very small and hairy. *Petals* two, rarely three, ensiform, thick and fleshy, from six to eight inches long, with the sides smooth, yellow on the inside, orange without. *Stamina* numerous, glandular-headed, forming a hemispheric ball round the germs. *Germs* from ten to twenty, sessile, clavate, very hairy, one-celled, ovula a few, imbricated upwards, and vertically attached to the inner margin of the styles, short. *Stigmas* II. large, recurved. *Berries* several, long-pedicelled, drooping, from two to four, joints linear- 669 oblong or sub-cylindric, smooth. *Seeds* one in each joint and of the same form, smooth. *Integument* polished, of the consistence of parchment. *Embryo* in the base of the perisperm, two-valved, from its inside innumerable fibres project exactly as in *Uvaria.* See *Gært. sem.* 2. 155. *t.* 114.

2. U. *discolor. Vahl. s.* 2. *p.* 63. *t.* 36. *Willd.* 2. 127.

Arboreous. *Leaves* bifarious, ovate-lanceolate, acute, smooth. *Peduncles* one-flowered. *Berries* from two to four, jointed; *joints* globular.

Uvaria *monilifera. Gært. sem.* 2. 156. *t.* 114.

Teling. Chilika doodooga.

A pretty large tree, a native of the mountainous parts of the Northern Circars and the country near Chittagong. *Trunk* straight, with a thin, conical, tapering head; bark scabrous. *Branchlets* bifarious, spreading. *Leaves* alternate, short-petioled, bifarious, from oblong to lanceolate, waved, smooth, pointed, from three to six inches long and about two broad. *Peduncles* leaf-opposed, or between the leaves, rather more than an inch long bracted below the middle, each supporting a single large, yellowish, sericeous, drooping flower. *Calyx*, three-leaved; *leaflets* oblong, conical, acute, much shorter than the corol, caducous. *Petals* six, lanceolate, sericeous, the three inner ones considerably smaller than the others. *Stamina* numerous, wedge-shaped, crowned with a large truncate brownish gland. *Anthers* a line on each side from the gland to the base. *Germs* about twenty, linear, densely clothed with ferruginous down. *Style* scarcely any. *Stigma* recurved, glandular, naked. *Berries* several, short-pedicelled, composed of from two to four roundish-oval, pretty smooth joints, attached to a firm globular receptacle. *Seed* solitary, round-oval. *Integument* single, brown, thin, hard, and polished. *Perisperm* conform to the seed, hard perforated, &c. as described by Gærtner. II.

The wood is employed for various economical purposes, but chiefly for rafters. 670

Note. An imperfect description and drawing, No. 956, have been sent to the Honourable the Court of Directors, at which time the flowers had not been seen.

3. U. *dumosa. R.*

Scandent. *Leaves* linear, oblong, base cordate, parallel-veined, downy underneath. *Petals* six, oblong and very large. *Berries* composed of two or three oval joints.

Tooba'chura, the vernacular name in Silhet, where it grows to be a very bushy climber. *Flowers* very large and pendulous, they appear during the hot season, and the seed ripens in October.

ATRAGENE. Schreb. gen. n. 949.

Gen. Char. *Calyx* inferior, four-leaved. *Petals* about twelve, seeds tailed.

A. *Zeylanica. Willd.* 2. 1287. *R. Corom.* 155. *pl.* 2. *N.* 188.

Tendrils two-leaved.

Beng. Chagul-batee.

Found in hedges in most parts of India. The root is tuberous, the stems and branches perennial, climbing. Flowering time the rains; the seed ripens in the cool season.

CLEMATIS. Schreb. gen. n. 960.

Gen. Char. *Calyx* none. *Corol* four, rarely five-petalled. *Seeds* with a long tail.

C. Gouriana. R.

Shrubby, climbing. *Leaves* decompound; *leaflets* ovate, lanceolate, entire. *Peduncles* II. axillary and terminal, trichotomous, many-flowered. *Petals* four, lanceolate, revolute. A 671 native of the interior of Bengal, flowers about the close of the rains; in the environs of the ancient city of Gour, it forms with *Pavana paniculu* extensive, lovely festoons.

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THALICTRUM. Schreb. gen n. 951.

GEN. CHAR. *Calyx* none. *Corol* of four or five petals; *styles*, persistent. *Seeds* without a tail.

1. T. *bracteatum. R.*

Perennial, scandent. Leaves opposite and three-fold, bi-and tri-ternate; *leaflets* long, cordate, ovate, entire; *peduncles* axillary, solitary, one-flowered, with two opposite cordate bractes above the base.

I received this very elegant, small, scandent, plant from Dr. Carey, who found it indigenous in the northern parts of Bengal. Flowering time the end of the cold season. *Root* perennial. *Stems* herbaceous, scandent, round, smooth, scarcely so thick as a pack thread and from two to four feet long. *Leaves* opposite or three-fold between bi-and tri-ternate; *leaflets* of an oblique, ovate, oblong, cordate shape, entire and smooth on both sides, size various, the largest seldom more than an inch long. *Peduncles* axillary, solitary, erect, one-flowered, with two opposite cordate bractes above the base. *Petals* four or six lanceolate, expanding, very pale blue. *Stamens*, one-fourth or one-fifth the length of the petals. *Germs* from fifteen to twenty. *Styles* scarcely any. *Seeds* with a sharp stiff back.

RANUNCULUS. Schreb. gen. n. 953.

GEN. CHAR. *Calyx* five-leaved. *Petals* five, with a honey-bearing pore within the claw. *Seeds* naked.

II. R. *indicus. R.*

672 Erect, annual; *calyces* spreading; *flowers* many, terminal, lower leaves petioled, three-parted, and ternate, with segments divided above, they are sessile, ternate and simple; *stamens* twenty; *seeds* smooth.

A native of Bengal, where it appears in shady places during the cold season. *Root* fibrous, annual. *Stem* erect, above very ramous, smooth, piped, about one and a half or two feet high. *Leaves* below petioled, three-parted and ternate, with leaflets divided above, sessile, ternate and simple, with leaflets linear-lanceolate; all are smooth on both sides. *Stipules* membranaceous. *Flowers* terminal, and from the divisions of the branchlets forming nearly an umbel, small and yellow. *Calyx* spreading, a little woolly outwardly. *Nectaries*, about twenty. *Seeds* sessile on a cylindric receptacle, oval, laterally compressed, with a pointed top.

CALYCANTHUS. Schreb. gen. n. 870.

GEN. CHAR. *Calyx* imbricated, squamous; *corol* many-petalled. *Germs* several, one-celled, one-seeded; *attachments* inferior.

C. *præcox. Willd.* 2. 1120. *Bot. Mag.* 466.

Leaves opposite, from lanceolate to ovate, oblong; *flowers* axillary, solitary, sub-sessile; *inner petals* smaller.

Obai. Kæmpf. amoen. 878. *t.* 899.

From China this sweet smelling, rigid shrub has been received into the Botanic garden at Calcutta, where it blossoms during the months of December, January and February, at which time it is nearly destitute of leaves, for they are deciduous in Bengal during the cold season.

III. 1

CLASS XIV.

DIDYNAMIA GYMNOSPERMIA.

AJUGA. Schreb gen. N. 959.

Calyx five-toothed. *Upper lip* of the corol small, bidentate, and shorter than the stamina.

1. A. *fruticosa. Roxb.*

Shrubby, erect, ramous, downy. *Leaves* broad-lanceolate, serrate; the superior pair of anthers simple, the lower pair twin.

Nepeta malabarica. Linn. sp. pl. ed. Willd. 357.

Tam. Retti pemeretti.

A native of the coast of Coromandel, where it is esteemed a medicine of considerable virtue by the inhabitants.

Stem erect, shrubby. *Bark* ash-coloured. *Branches* with four rounded angles, and furrowed sides, all the young tender parts covered with much, very soft, white down; height of the shrubs from four to six feet. *Leaves* opposite, short-petioled, drooping, cordate-lanceolate, or broad-lanceolate, serrate, and clothed like the young branches with much soft, white

III. 2 down, from one to six inches long, and about one-fourth of that in breadth. *Flowers* numerous, large, purple, sessile, alternate, on opposite, decussate, dichotomous, downy, ramous spikelets, which terminate the branches. *Bractes* filiform, and like every other part of the plant, downy. *Calyx* somewhat gibbous, mouth five-cleft, downy; *corol, upper lip* erect, entire, shorter than the stamina; the *lower* one three-lobed, with the middle tube cordate, emarginate, of a lively purple colour, and much larger than the paler coloured, posterior, or

lateral lobes. *Filaments* nearly equal, and adhering to each other. *Anthers* on the short, or exterior pair of filaments, twin, on the long or inner pair, single. Page Carey Ed.

2. A. *disticha. Roxb.*

Annual, ramous. *Leaves* cordate, serrate, downy. *Spikes* axillary, two-cleft, recurvate, secund. *Bractes* subulate. *Lower anthers* twin.

Ballota disticha. *Linn. sp. pl. ed. Willd.* iii. 108. and probably *Nepeta indica* of the same, iii. 57.

Beng. Gobura.

Tsjadaen. *Rheed. Mal.* x. *t.* 88.

This is one of our largest annuals; it grows in hedges, &c. where the soil is good and dry. Flowers during the wet and cold seasons.

Stems erect, four-sided, with a few pairs of opposite branches, downy, from three to six feet high. *Leaves* opposite, petioled, cordate, obtusely serrate, very soft, downy, three inches long, and two broad. *Flowers* seemingly verticelled, but are arranged alternately; *ovula* recurved; *spikes* sessile in the opposite axills; there is always a single flower stands between the pair of spikes. *Bractes* subulate, hairy, two to each flower. *Calyx* gibbous, five-toothed, (never ten-striated). *Corol; tube* length of the calyx; *upper lip* green, short, entire, projecting; *under lip* many times larger, recurved, about the middle it is enlarged with two wings, beyond which it expands into two, large, deep purple, orbicular, crenulate, depending segments. *Stamina* the short pair twin. *Anthers*, the larger single. III. 3

Obs. The family character does not well accord with that of *Ballota*, nor of *Nepeta*; I have therefore removed it to *Ajuga*.

3. A. *repens. R.*

Biennial, procumbent, hairy. *Leaves* from oblong to lanceolar, tapering down the petioles, grossly and unequally serrate; *spikes* terminal, cylindric. *Bractes* oblong, ventricose, five-flowered, or ten to the verticel.

A native of Chittagong. Flowers in December and January, and the seed ripens in February and March.

Is rather a robust species, spreading over a space of about two feet in diameter; the lower branches generally emit root from the joints, which rest on the ground.

TEUCRIUM. Schreb. gen. N. 960.

Calyx five-parted. *Corol* with the *upper lip* two-parted beyond the base, where the stamina are.

T. *stoloniferum. Roxb.*

Root perennial, stoloniferous. *Stems* straight, four-sided. *Leaves* cordate, serrate, rugose. *Panicles* terminal.

A native of the eastern parts of Bengal. Flowering time the rainy season.

Root perennial, producing numerous runners, which spread wide, and propagate fast. *Stems* annual, erect, four-sided, villous, simple till near the top of the plant, where there are a few pairs of opposite branchlets; the whole plant about two feet high. *Leaves* opposite, petioled, drooping, cordate, serrate, a little wrinkled, soft, and a little villous. *Petioles* shorter than the leaves, channelled. *Panicles* terminal, which includes the whole of the top of the plant. *Bractes* opposite, elliptic, villous, one-flowered. *Flowers* numerous, small, of a lively pink.

ELSHOTZIA. Willd. III. 4

Calyx tubular, five-toothed. *Corol* bilabiate; the *upper lip* three- (four- Willd.) parted the *under lip* undivided. *Stamina* distant.

E. *villosa. R.*

Shrubby, downy. *Leaves* ovate, lanceolate, serrate; *spikes* panicled, sub-secund.

Rujat the vernacular name in Silhet, where it is indigenous, and is used in complaints of the bowels by the natives. Flowering time the rainy season.

MENTHA. Schreb. gen. N. 967.

Calyx five-toothed. *Corol* nearly equal, four-cleft. *Stamina* erect, distant.

1. M. *paniculata. R.*

Annual, erect; *branches* brachiate. *Leaves* long-petioled, triangularly cordate, grossly serrate. *Spikes* cylindric, panicled.

A native of the hills of Chittagong, where it blossoms during the cool season. The natives use the leaves in their curries on account of their grateful smell and taste.

2. M. *auricularia, Willd.* iii. 74.

Spikes terminal, cylindric, mixed with ciliate bractes. *Leaves* sub-sessile, oblong, serrate, hairy. *Stamina* longer than the corol.

Majana foetidia. *Rumph. Amb.* vi. *t.* 16. *f.* 2. bad.

A native of the Moluccas, and rather a weak, flaccid, ramous, four-sided, hairy plant.

3. M. *quadrifolia. Roxb.* III. 5

Perennial, erect, stems round. *Leaves* four-fold, nearly linear, serrate; *spikes* terminal, cylindric. *Filaments* hairy, and longer than the corol.

Teling. Konda-jajain.

This seems an undescribed species, it is perennial, a native of the tops of hills, and the

Page Carey Ed. middle region of the Circar mountains, growing amongst the rocks. It flowers during the rainy season.

Stems many, erect, with a few branches, woody, round, from two to four feet high. *Leaves* four-fold, rarely three-fold, spreading, short-petioled, linear-lanceolate, serrate, rugose, downy, from two to three inches long, and about half an inch broad. *Spikes* terminal, solitary, cylindric, crowded with innumerable, small, rose-coloured flowers. *Corol; tube* twice the length of the calyx, segments reflexed. *Filaments* much longer than the corol, sub-equal, very hairy.

This plant is very fragrant, not less so than our garden mint in Europe; common garden soil is too moist and too rich for it, for there it has always soon perished with me.

4. M. *verticellata. R.*

Annual, erect. *Leaves* verticelled, sessile, linear-lanceolate, serrate. *Spikes* terminal, cylindric.

Beng. Panee-kula.

Found in wet places near Calcutta, appears and flowers during the rains.

Stems annual, erect. *Branches* a few near the top, and verticelled. *Leaves* verticelled, sessile, linear, serrate. *Spikes* solitary, terminal, cylindrical. *Filaments* woolly, twice the length of the corol.

The plant has a considerable share of aromatic smell, and taste.

5. M. *stellata. Buch.*

III. 6 *Spikes* terminal, cylindric. *Leaves* filiform, minute, verticelled.

6. M. *fruticosa. Roxb.*

Shrubby. *Leaves* ovate-lanceolate, serrate, downy. *Panicles* brachiate, terminal. *Filaments* and *style* much longer than the corol, and variously bent.

A native of the Circar mountains.

Shrubby. *Leaves* from cordate to oval, serrate. *Spikes* terminal, secund, flowers fascicled. *Stamens* hairy, double the length of the corol.

Beng. Jul-luta.

Elsholtzia. *Banksian herbarium.*

This plant is common, and indigenous all over Bengal; flowering time the end of the cold season.

Stems many, shrubby, erect, ramous, round, smooth, coloured. *Leaves* opposite, petioled, oval and cordate, grossly serrate, when young downy, with the veins and nerves coloured, from four to six inches long. *Petioles* roundish, slightly channelled, much shorter than the leaves. *Spikelets* terminal, and from the exterior axills, secund, very numerous, the whole of each branch forming a long panicle. *Bractes* numerous, hairy, and ciliate, the exterior one of every other pair is generally abortive; in the axill of each of the other three fertile ones is a fascicle or two, of from four to twelve smaller falcate bractes, embracing like an involucre, about as many flowers. *Calyx* sub-cylindric. *Corol; upper lip* broad, three-parted, erect; *under lip* entire, ovate, pointed. *Filaments* double the length of the corol, hairy. *Style* the length of the stamina. *Stigma* two-cleft, segments tapering and expanding.

The plant possesses a strong, heavy, aromatic smell and bitterish taste.

7. M. *sativa. Willd.* iii. 79.

Flowers verticelled. *Leaves* elliptic, serrate. *Stamina* longer than the corol.

Beng. Poodena, Pudun, &c.

III. 7 Found common in gardens throughout India.

8. M. *perilloides. Linn. sp. pl. ed. Willd.* iii. 83.

Annual, hairy. *Leaves* cordate, grossly serrate. *Racemes* terminal, and axillary, sessile, four-sided. *Flowers* in opposite approximate pairs, sub-secund. *Bractes* as long as the flowers. *Stamens* shorter than the corol.

Perilla ocymoides. *Linn. sp. pl. ed. Willd.* iii. 83.

A native of Nepal, from thence Dr. Buchanan sent the seeds to this garden, where, in one year from the time the seed was sown the plant blossomed abundantly.

Stem erect, with four rounded angles, and excavated sides, hairy. *Branches* opposite, expanding, and, like the stem of the most luxuriant plants, about three feet high. *Leaves* opposite, long-petioled, broad, cordate, grossly-serrate, hairy on both sides, from three to five inches long, and from two to four broad. *Petioles* hairy, channelled. *Racemes* axillary and terminal, sessile, four-sided, particularly before the flowers expand. *Bractes* lanceolate, acute, one-flowered. *Flowers* in opposite, decussate, approximate pairs, tending to point to one side only. *Calyx* hairy; divisions five, nearly equal. *Corol*, the *upper* segment emarginate; the *under* one much broader and longer, sub-reniform. *Stamens* rather shorter than the corol. *Anthers* of two distinct lobes.

GLECHOMA. Schreb. gen. N. 970.

Calyx five-cleft, each pair of anthers converging in form of a cross.

G. *erecta. Buch.*

Annual, erect. *Leaves* cordate. *Peduncles* axillary, bearing several flowers in a head.

A native of the skirts of the mountains of Nepal where it is called *Niasbo* by the natives, and used internally as a remedy in Gonorrhea. From thence the seeds were sent by Dr. Buchanan, under the above name, to the Botanic garden where the plants thrive well, blossom and ripen their seed all the year round.

III. 8 *Root* annual. *Stems* nearly erect, four-sided, villous, branchy near the base, from one to

two feet high. *Leaves* opposite, petioled, cordate, serrate, downy. *Peduncles* axillary, solitary, round, longer than the petioles, supporting a dichotomous head of many small purple flowers, at and near the apex they become more and more approximate, and the leaves smaller and smaller, and may then be called exterior bractes. *Bractes* numerous, lanceolate, ciliate. *Calyx* ventricose, ten-ribbed, five-toothed, villous. *Anthers* twin. *Seeds* very small. Page Carey Ed.

The plant possesses a pleasant smell, not unlike that of balm, and has a pungent bitterish taste.

LEONURUS. Schreb. gen. N. 977.

Anthers sprinkled with glossy dots.

L. *Tataricus. Willd.* iii. 116.

Annual, erect, four-sided. *Leaves* from bipinnatifid to simple. *Calyces* with divisions daggered. *Involucres* bristly, upper lip of the corol vaulted.

Cardiaca foliis tenuis, &c. *Mill. fig. A.* 80.

Its native place uncertain, though common in gardens all over India. It is a plant of short duration, not more than three or four months, but there is a constant succession of them all the year round.

PHLOMIS. Schreb. gen. N. 978.

Calyx angular, toothed; *upper lip* of the ringent corol vaulted, incumbent, villous.

1. P. *repetifolia. Willd.* iii. 126.

Annual, straight. *Leaves* long-petioled, cordate, serrate, downy. *Calyx* eight-spinous-toothed, the upper and lower larger.

Hind. Hejur-chei. III. 9

Is a native of hedges, old mud walls, &c. It is a very specious-looking plant; flowering in the cold season.

Stem annual, straight, four-sided, simple, from four to six feet high. *Leaves* opposite, spreading, petioled, cordate, serrate, pointed, downy, from four to eight inches long, and two or three broad. *Floral leaves (bractes verticillorum,)* lanceolate, depending. *Petioles* channelled, winged with the decurrent leaf; *verticels* globular, two, three or four, towards the apex of the plant, about five inches asunder. *Involucres* many, subulate. *Flowers* numerous, of a deep rich orange colour. *Calyx* ten-striated, eight-toothed, of which the six lateral ones are smoothest, all very sharp. *Corol; under lip* very short, three-toothed, at all times of a dirty withered colour. Cattle do not eat of it, nor is it put to any use that I know of.

2. P. *zeylanica. Willd.* iii. 123.

Annual, straggling. *Leaves* linear-lanceolate, somewhat serrate. *Calyx* obliquely and slightly eight-toothed. *Verticel* axillary.

Herba admirationis. *Rumph. Amb.* vi. *t.* 66. *f.* 1.

Tumba. *Rheed. Mal.* x. *t.* 91.

Hind. and *Beng.* Hull-khusa.

Teling. Poo-alla-tumi.

This is one of the most common plants, every soil seems to suit it; but it delights most in rubbish.

Stem annual, when old straggling, four-sided, angles rounded, about two feet high; *branches* opposite. *Leaves* remote, short-petioled, narrow-lanceolate, remotely and slightly serrate, a little downy, from two to three inches long and about one quarter of an inch broad. *Verticels* two or three towards the apex, small, globular. *Involucres* subulate. *Calyx* ten-striated, curved, widening; *mouth* oblique, slightly eight-toothed. *Flowers* white; *upper lip* short, projecting, hairy, vaulted; the *under lip* large, three-parted; middle divisions broad, truncated. *Anthers* two-lobed, one over the other. III. 10

This plant has a pleasant faint aromatic smell, its flowers are used by the brahmins to decorate their idols. In the Banksian herbarium, two other specific names are attached to it, viz. *obliqua* and *malabarica.*

3. P. *esculenta. Roxb.*

Annual, erect, ramous. *Leaves* lanceolar, serrate, downy; *heads* generally terminal or with one globular verticel at the next pair of the leaves. *Calyx* obliquely ten-toothed.

Hind. and *Beng.* Choota-hull-koossa.

Teling. Manchy tumi, or tumi-kura.

This species is annual, it grows common on dry cultivated lands. Flowers during the wet season.

Stem annual, erect, ramous, four-angled, four-grooved, downy, from one to two feet high. *Leaves* opposite, short-petioled, broad-lanceolate, serrate, downy, about two inches long and three quarters of an inch broad. *Verticels* one or two, many-flowered. *Involucres* very numerous, subulate, ciliate. *Calyx* obliquely ten-toothed.

The plant possesses a considerable degree of a peculiar fragrance; its leaves are used as a potherb by the natives.

4. P. *cephalotes. Kön. Mss.*

Annual, erect, ramous. *Leaves* ovate-lanceolate, acute, serrate, downy. *Heads* terminal. *Involucres* lanceolate, ciliate. *Calyx* with the mouth even, and cut into ten equal divisions.

Hind. and *Beng.* Bura-hul-khusa.

Teling. Gurosa-tumi.

Page Carey Ed. III. 11

Like the former (P. *esculenta*,) but in other respects they are dissimilar. *Leaves* opposite, short-petioled, oblong, pointed, serrate, soft, downy, about two inches long, and less than one broad. *Verticels* generally solitary, terminal, globular, many-flowered. *Flowers* numerous, white. *Involucres* numerous, imbricate, lanceolate, incurved, ciliate. *Calyx* erect, gibbous, ten-striated; *mouth* horizontal, ten-toothed. *Corol upper lip* erect, vaulted, very hairy; *under lip* as in the rest. *Anthers* oval (not two-lobed.)

It differs from P. *zeylanica*, and *esculenta*, in the form of the involucres, calyx, and anthers, as well as in the general habit of the plants. No use is made of this species.

5. *P. calycina. Roxb.*

Diffuse, villous. *Leaves* long-ovate, grossly and bluntly serrate, smooth. *Peduncles* few-flowered. *Calycine segments* five, cuneate, as long as their tube.

A native of the northern parts of Hindoostan.

6. P. *urticifolia. Willd.* iii. 124.

Annual, erect, four-sided, villous. *Leaves* ovate, bluntly serrate, smooth; *verticels* several, globular, many flowered. *Involucres* pedicelled, linear-lanceolate, ciliate, mucronate. *Calyx* obliquely ten-mucronate-toothed.

A native of Coromandel, and also found wild in Hindoostan by Col. Hardwicke.

7. P. *moluccana. Roxb.*

Annual, erect, ramous, villous. *Leaves* petioled, from oval to rhomboidal, crenate. *Flowers* in axillary fascicles. *Involucre* minute. *Calyx* even, ten-ribbed, ten-toothed, alternately smaller.

A native of the Moluccas.

8. P. *montana. Kön. Mss.*

Perennial, ramous, downy. *Leaves* short-petioled, ovate-cordate, serrate. *Verticels* few-flowered, mouth of the calyx even, and cut into ten equally sharp-toothed segments.

Compare with P. *chinensis. Willd.* iii. 125.

Is a native of hills, and dry barren spots, &c.

III. 12

Stem short, perennial; *branches* ascending, four-sided, downy, from one to two feet high. *Leaves* opposite, short-petioled, ovate-cordate, crenulate, downy, about an inch long, and three quarters of an inch broad. *Verticels* numerous, from six to twelve flowered. *Involucres* few, linear, erect, many times shorter than the calyx. *Flowers* white. *Calyx* straight, widening, ten striated, ten toothed. *Corol*; *upper lip* erect, vaulted, hairy; *under lip* horizontal, broad, three-lobed; middle lobe slightly four-parted.

9. P. *biflora. Willd.* iii. 124.

Creeping, four-sided. *Leaves* petioled, ovate-oblong, serrate, smooth. *Flowers* in axillary pairs; *calyx* toothed, alternately smaller.

Leucas foliis rotundis, serratis, flore albo, *Burm. Zeyl.* 140. *t.* 63. *f.* 1. agrees pretty well with this plant.

It is common about Calcutta; and in flower most part of the year.

Stems or *branches* perennial, numerous, creeping; when young four-sided, almost smooth. *Leaves* opposite, petioled, erect, ovate-oblong, posterior sides entire, interior grossly ovate, smooth. *Flowers* generally solitary, though sometimes in pairs, axillary, peduncled, white. *Involucres* few, very small, subulate. *Calyx* funnel-shaped, ten-striated, ten-toothed, teeth alternately smaller. *Corol*, of two lips nearly equal in length; the *upper* one erect, vaulted, and very hairy; the *under* one very broad, and three-parted.

10. P. *pilosa. Roxb.*

Perennial, erect, hairy. *Leaves* cordate, serrate, soft and hairy. *Flowers* axillary, sub-solitary, sessile, naked. *Calyx* with an even, ten-toothed mouth.

A native of Bengal, where it flowers during the rains.

III. 13

Root perennial. *Stem* and *branches* erect, four-sided, soft and hairy. *Leaves* opposite, short-petioled, oblong cordate, serrate, hairy and very soft, about two inches long, by one or one and a half broad. *Flowers* axillary, generally solitary, naked; sub-sessile, white. *Calyx* ten-striated; *mouth* even, hairy; *upper lip* vaulted, and very hairy; the *under* one of three, broad, villous segments.

CLINOPODIUM. Schreb. gen. N. 980.

Involucre many-leaved under the verticel. *Calyx* bilabiate. *Corol*, with *upper lip* plain, obcordate, and straight.

C. *repens. R.*

Root annual. *Stems* and *branches* four-sided, creeping, clothed with recurved hairs. *Leaves* short-petioled, ovate, crenate-serrate. *Verticels* numerous. *Bractes* subulate, very hairy.

A native of Nepal, from thence Dr. Buchanan sent the seeds to the Botanic garden at Calcutta in November 1802, where the plants blossom during the rains.

Root generally annual, fibrous. *Stems* and *branches*, while the plants are young, nearly erect, but with the branches soon becoming procumbent, and lastly creeping; all are four-sided, and clothed with many, white, recurved hairs. *Leaves* opposite, from one to two inches asunder, short-petioled, ovate, cordate, with the interior margins crenate, serrate, hairy, and wrinkled, about one inch long, and three quarters of an inch broad. *Verticels* numerous, from ten to fifteen-flowered. *Flowers* small, rose-coloured. *Involucres* subulate, and ciliate with numerous, long distinct hairs. *Calyx* striated, hairy.

OCYMUM. Schreb. gen. N. 986.

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Calyx with the upper lip circular, lower one four-parted. *Corol* resupinate, with the superior lip four-cleft; the other undivided. *Exterior filaments* (in some of the species) crested near the base.

1. O. *villosum. R.* III. 14

Shrubby. *Branches* round, villous. *Leaves* ovate, oblong, obtuse, serrate, downy. *Bractes* petioled, reniform, cordate, acuminate.

Urjuka, its Sanscrit name. See *Asiat. Res.* iv. 288. 9.

Hind. and *Beng.* Toolasi, or Toolsi.

Soladi-tirtava. *Rheed. Mal.* x. *t.* 87.

This charming species in common in gardens and about the temples of the Hindoos over every part of India; it is in blossom most part of the year.

Stem erect, short, woody, round. *Bark* with a thin, light-brown, scaly epidermis. *Branches* numerous, the tender shoots clothed with much soft white hair. General height of the whole plant from two to three feet. *Leaves* opposite, petioled, ovate, oblong, crenate serrate, obtuse, downy, from one to two inches long. *Petioles* half the length of leaves, downy. *Racemes* terminal, solitary or triple. *Flowers* triple, and opposite, appearing verticelled, of a pale, greenish pink. *Bractes* opposite, petioled, reniform, cordate, acute.

2. O. *sanctum. Willd.* iii. 162.

Somewhat shrubby. *Branches* round, hairy. *Leaves* oval, serrate, downy. *Bractes* petioled, broad-cordate. *Filaments* crested.

Nalla-Tirtava. *Rheed. Mal.* x. *t.* 85.

Purnasa the Sanscrit name. See *Asiat. Res.* iv. *p.* 188.

Beng. and *Hind.* Kala, or Krishna Toolasi or Toolsi.

Teling. Krishna toolasi.

Is always found cultivated in the gardens belonging to the Hindoo temples, in flower all the year round.

Stem short, woody, perennial. *Branches* numerous, opposite, round, dark purple, hairy. *Leaves* opposite, petioled, oval, serrate, downy, dark-coloured, about an inch and a half long, and one inch broad. *Racemes* terminal, erect, dark purple, hairy, four-sided. *Bractes* opposite, petioled, cordate, reflexed, three-flowered, (*i. e. verticels* six-flowered.)

This is a very grateful smelling plant, the brahmins hold it sacred to their gods Krishnu and Vishnu.

3. O. *album. Willd.* iii. 160. III. 15

Annual, erect, bushy. *Leaves* short-petioled, ovate, cordate, remotely serrulate. *Racemes* terminal, sessile. *Bractes* petioled, ovate-cordate, three-flowered. *Upper lip* of the calyx round-reniform. *Filaments* crested, as long as the subcampanulate corol.

4. O. *bullatum. Lamarck. Encyclop.* i. 384.

Found in gardens only, and as the natives have no vernacular name for it, I conclude it is not a native of the continent of India. The scent is very powerful, more so, I think than any other species I have met with.

5. O. *thyrsiflorum. Willd.* iii. *p.* 158.

Biennial, erect, ramous, smooth, four-sided, four-grooved. *Leaves* broad-lanceolate, scarcely serrulate. *Panicles* terminal. *Bractes* broad-lanceolate. *Filaments* rather longer than the corol, and crested.

To Dr. Rottler of Madras I am obliged for the seed of this species, which has been the means of introducing it into Bengal, where it was not known before. It is in flower, chiefly during the rainy and cool seasons, though more or less the whole year. *Seed* in perfection throughout the dry season. *Stem* erect, *branches* many, opposite, spreading, four-sided; sides deeply grooved, the whole plant about three feet high. *Leaves* petioled, opposite, broad-lanceolate, on the interior margins of the largest are two or three remote serratures, sharp-pointed. *Panicles*, a terminal, ovate, dense one to each branch, ramifications thereof decussate. *Flowers* large, pale pink, forming a pretty contrast with the ferruginous calyces and bractes. *Bractes* opposite, lanceolate, ciliate, three-flowered, of a deep ferruginous colour. *Calyx; upper lip* orbicular, and ciliate, and its upper surface of the same colour as the bractes; *under lip* four-cleft. *Corol; upper lip* broad, four-parted; the *under* one of the same length, linear-oblong, with a rounded crenate apex. *Filaments*, the superior short pair amply crested. III. 16

This is one of the most fragrant, and prettiest species of *Ocymum* we have in India.

6. O. *caryophyllatum. Roxb.*

Shrubby; *branches* polished. *Leaves* broad-lanceolar, serrulate, smooth. *Bractes* petioled, lanceolate.

Hind. and *Beng.* Goolal-toolasi.

Is found about the temples, and in the gardens of the Hindoos. Is in blossom most part of the year, but chiefly during the latter part of the rains, and the cold season.

Stem erect, somewhat woody. *Branches* opposite, nearly round, and polished; height of the whole plant, from two to six feet. *Leaves* opposite, petioled, broad-lanceolar, pointed, slightly serrate, smooth on both sides, about three inches long, of which the petiole occupies about one-fourth part. *Racemes* terminal, erect, rachis furrowed, villous. *Bractes* petioled, lanceolate, somewhat ciliate, coloured. *Flowers* with pretty long peduncles, pretty large, and white. *Calyx; upper lip* nearly round, and ciliate. *Corol* hairy on the outside; *upper lip* erect, four-parted; *under lip* oblong, and much longer than the upper. *Filaments* rather longer than calyx, larger pair jointed, and crested near the base.

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7. O. *pilosum Roxb.*

Shrubby; *branches* four-sided, and furrowed. *Leaves* ovate oblong, serrate. *Bractes* petioled, sub-orbicular, hairy; *upper lip* of the calyx orbicular and hairy, with corol twice its length.

Beng. Babooi-toolsi.

A native of India.

III. 17 *Stem* erect. *Branches* opposite, expanding, with four furrows on the sides; young parts hairy. *Leaves* opposite, petioled, ovate, and ovate-oblong, serrate, both sides smooth, with the margins slightly ciliate, about two inches long, including the petiole. *Racemes* terminal, erect, rigid, hairy, with the six-flowered verticels approximate. *Bractes* petioled, ciliate, sub-orbicular, with a sharp point. *Flower* very short-peduncled, pretty large, and white. *Calyx* hairy, *upper lip* orbicular. *Corol; upper lip* four-parted, hairy on the outside; *under lip* oblong, concave, with the margins waved. *Filaments* the large pair, with a large hairy process near the base.

The seeds steeped in water swell into a pleasant jelly, which is used medicinally by the natives.

8. O. *gratissimum. Willd.* iii. 110.

Shrubby; *branches* four-sided, smooth. *Leaves* oblong-ventricose, serrate, smooth. *Bractes* short-petioled, cordate-lanceolate.

Hind. Ram-tulasi.

The whole plant, I think diffuses a stronger degree of fragrance, than any other of the genus. It is only found in gardens, and about the temples of the natives.

Stem erect, woody, perennial. *Bark* ash-coloured. *Branches* opposite, erect, four-seeded, when young smooth, glossy and green; whole height of the plant from four to eight feet. *Leaves* opposite, long-petioled, drooping, oblong, ventricose, remotely serrate, pointed, smooth on both sides, often six inches long, including the petiole, which is about a third of the whole. *Racemes* terminal, pretty long, rigidly erect, with the verticels of six flowers pretty close. *Bractes* short-petioled, reflexed, cordate-lanceolate. *Calyx; upper lip* marked with three nerves. *Corol* short, scarcely larger than the calyx, of a pale yellow underneath, oblong, concave, and entire. *Filaments* longer than the corol, with a large tuft of dark yellow hairs on the joints of the large pair near the base.

III. 18 9. O. *Basilicum. Willd.* iii. 161.

Annual, the whole plant somewhat ferruginous. *Leaves* ovate-oblong, grossly and acutely serrate, smooth. *Bractes* lanceolate, ciliate. *Upper lip* of the calyx broad-cordate. *Stamina* and *style* longer than the corol. *Filaments* amply crested.

A native of Persia, from thence sent to the Botanic garden at Calcutta, under the Persian names, *Deban shah*, and *Deban Macwassi*. It is very nearly allied to our Indian *Goolal tulasi*, and to the *thyrsiflorum*. In Bengal it flowers during the rains and the cool season.

10. O. *polystachyon. Willd.* i. 365.

Annual. *Stem* and *branches* four-sided, with sharp angles. *Leaves* sub-cordate, serrate. *Spikes* terminal. *Bractes* petioled, round-cordate. *Stamens* the length of the corol, not crested.

Teling. Neeru. *i. e.* water tulasi.

Is a native of ditches, and wet places. It flowers during the rainy season.

Stem annual, erect, from three to four feet high, four-sided, with very sharp angles, which are armed with small, sharp, scabrous excrescences. *Branches* numerous, opposite, like the stem. *Leaves* opposite, spreading, petioled, cordate, pointed, serrate; about two inches long, and one and a half broad. *Petioles* four-sided. *Racemes* terminal, and axillary, erect; *verticels* approximate. *Bractes* petioled, cordate, pointed, three-flowered. *Corol* twice the length of the calyx, all the divisions of the border are of the same length; *under lip* concave. *Filaments* wanting the characteristic processes of hairs. Cattle eat it. It possesses little or no fragrance.

11. O. *tuberosum. Roxb.*

Herbaceous, four-sided, smooth. *Leaves* sessile, oblong, grossly serrate, smooth. *Bractes* oval. *Filaments* crestless.

III. 19 Is a native of vallies among the Orissa mountains; the whole plant is about a foot high. *Root* perennial, the fibres end in pretty large tubers. *Stems* several, short, annual, four-sided, smooth. *Leaves* opposite, short-petioled, oblong, very grossly serrate, running down the petioles near the base; smooth, six inches long, and about two broad. *Racemes* terminal, solitary; *verticels* remote. *Bractes* oval, three-flowered. *Flowers* rose-coloured, large. *Filaments* wanting the characteristic processes, or crest.

12. O. *cristatum. B. H.* and *Kön. Mss.*

Annual, four-sided. *Leaves* oval, crenate, serrate, dotted. *Bractes* linear, inserted in glandular receptacles. *Stamens* twice the length of the corol, crested.

A native of dry, barren spots; such as old dry walls, &c. Flowering time the wet season; it is entirely destitute of smell.

Stem erect, annual, or biennial, short, four-sided, slightly hairy, branchy, from twelve to eighteen inches high, angles rounded, sides grooved. *Branches* opposite, like the stem. *Leaves* opposite, petioled, oval, crenate-serrate, both sides covered with innumerable, minute, glandular pits. *Racemes* terminal, verticelled. *Verticels* six-flowered, less than an inch asunder. *Bractes* opposite, linear, longer than the flowers, sometimes a little twisted, caducous, each having a large, round, permanent, concave gland, into which it was or is inserted. This is an excellent specific mark. *Flowers* of a pale rose-colour, projecting horizontally. *Stamens* equal, more than twice the length of the corol, projecting apices erect; processes large and hairy. *Anthers* incumbent, oval.

Note. The long, linear bractes, with their concave, glandular receptacles, and the long stamens, are excellent specific marks. Page Carey Ed.

13. O. *inodorum. Kön. Mss.*

Bi-triennial, four-seeded. *Leaves* cordate, crenate-serrate, rugose. *Bractes* cordate, sessile. *Stamens* the length of the corol, crestless. III.

A small, bi- tri- or perennial species, from one to two feet high; grows about old walls, and under the shade of bushes, forests, &c. where the soil is dry. Flowering time in the wet and cold seasons. 20

Stem very trifling, erect, somewhat woody. *Branches* opposite, four-sided, pretty smooth; sides grooved; angles rounded. *Leaves* opposite; *petioles* cordate, a little rugose, crenate-serrate, from one to two inches long. *Racemes* terminal, verticelled; *verticels* six-flowered. *Bractes* broad-cordate, acute, reflexed. *Flowers* very minute, scarcely appearing without the calyx. *Stamens* toothless.

This species is void of fragrance.

PLECTRANTHUS. Schreb. gen. N. 987.

Calyx with upper divisions larger. *Corol* resupinate, gibbous, or spurred at the base. *Filaments* simple.

1. P. *secundus. Roxb.*

Annual, erect, ramous, four-sided. *Leaves* round-cordate, crenate-serrate, long-petioled. *Floral leaves* sub-sessile. *Racemes* terminal, sub-secund, with opposite, three-nerved, from one to three-flowered bractes. *Nectary* gibbous. *Under lip* of the corol entire.

Ocimum molle. Willd. iii. 166.

A native of Mysore, from thence the seeds were sent by Mr. Heyne, to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and blossom about the close of the rainy season.

Root ramous, annual. *Stem* erect, four-sided, with rounded angles; villous. *Branches* opposite, ascending, and like the stem; whole height from two to three feet. *Leaves* opposite, those of the stem and branches, long-petioled, floral leaves short-petioled; all are round-cordate, somewhat rugose, sub-sessile, and tomentose, margins crenate-serrate, with generally a smaller serrature between the larger; the usual size from one to four inches each way. *Petioles* as long as the leaves, slightly channelled. *Racemes* terminal, one, two, three, or more together, sub-secund. *Rachis* four-sided, villous. *Bractes* opposite, sessile, from ovate-oblong to cordate, generally three-nerved. *Flowers* pedicelled, from one to three belonging to each bracte, pointing to the outside, small, pale yellow. *Calyx; upper lip* cordate; the *under* one deeply divided into four long, acute, ascending divisions. *Corol*, base of the tube gibbous; *upper lip* erect, four-parted; the *under* one entire, horizontal, boat-shaped; the margins generally shut over the round two-lobed anthers. III. 21

The smell of the fresh leaves is somewhat spicy, but with a degree of heaviness, that renders it rather unpleasant than otherwise.

2. P. *scutellarioides. Roxb.*

Perennial; the whole plant of a deep purplish colour. *Leaves* ovate-oblong, obtusely serrate. *Panicles* terminal, racemose, verticels of four ramous pedicels. *Nectary* gibbous.

Ocimum *scutellarioides. Willd.* iii. 166.

Majorana rubra. *Rumph. Amb.* v. *p.* 291. *t.* 101.

Ocimum *scutellarioides. Mant.* 84.

Introduced into the Botanic garden at Calcutta among plants from the Moluccas, in 1798. It is in blossom about the close of the rains, and more or less the whole year round.

Stem erect, somewhat woody. *Branches* deeply coloured and villous. The whole plant about three feet high. *Leaves* opposite, petioled, ovate-oblong, obtusely serrate, rugose, somewhat downy, and like the young shoots of a deep purplish green, particularly on the under side; from one to three inches long. *Racemes, (panicles)* terminal, long and slender. *Bractes* sub-sessile, cordate, acuminate, deciduous. *Verticels* of the raceme of four, many-flowered racemuli. This alone is an excellent specific character. *Corol, tube, throat,* and *upper lip* white; *under lip* boat-shaped, and of a light blue colour. *Filaments* smooth, united by pairs near the base, and without a process, as in the *ocymums.*

3. P. *monadelphus. Roxb.* III. 22

Annual, fleshy, diffuse. *Leaves* oval, crenate, fleshy. *Racemes* before the flowers open strobiliform, from four imbricated rows of ovate, acuminate, concave, caducous bractes. *Nectary* gibbous. *Stamens* united.

A native of dry barren hills about Bangalore. From thence the seeds were sent by Mr. Heyne to the Botanic garden at Calcutta, where the plants grow luxuriantly, and blossom during the cool season.

Root annual. *Stem* short. *Branches* numerous, opposite, spreading, round, pale green, clammy, clothed with long soft hairs; the whole plant not above one foot high, but expanding three or four times as much. *Leaves* opposite, with smaller ones in their axills, short-petioled, oval, and obovate, fleshy, with the exterior margin crenate, from one to two inches long. *Racemes* terminal, solitary, erect, before the blossoms expand exactly four-sided; being thin, imbricated with four rows of broad, ovate-cordate, acuminate, concave, caducous bractes; after they fall off cylindric. *Flowers* numerous in approximate verticels of six (three on each side) large, and of a lively light purple colour. *Calyx* as in the genus, hairy, and the inside of its mouth clothed with many hairs. *Corol* resupine. *Tube* with a somewhat gibbous base; *upper lip*

Page Carey Ed. four-parted, the *under* one ovate, concave, entire. *Filaments* as long as the lower lip of the corol, all the four firmly united for more than half their length, forming a tube, as in the diadelphous plants, for the style; a scale embraces the two lower seeds of the pistil.

The whole plant possesses a strong, though not disagreeable smell.

4. P. *aromaticus. Roxb.*

Perennial, villous. *Leaves* short-petioled, round-cordate, crenate, fleshy, downy, rugose, crenulate. *Spikes* solitary, verticelled. *Bractes* caducous.

III. 23 *Hind.* and *Beng.* Pathur-choor.

This most agreeably fragrant plant, is common in almost every garden in India, but very rarely found in flower; this viz. the beginning of June, is only the second time I have found it in that state in the Company's Botanic garden at Calcutta.

Stems creeping, round, succulent, perennial. *Branches* erect, round, very succulent, fragile, hairy, from one to two feet high. *Leaves* opposite, short-petioled, fleshy, fragile, broad-cordate, crenulate, a little hairy, rugose, particularly the under side; generally about two inches each way. *Spikes* terminal, erect, long, verticelled, before the flowers expand imbricated with four rows of caducous bractes. *Flowers* numerous, blue. *Perianth* hairy; *upper lip* broad, as in *Ocymum*; the *under lip* long, projecting, concave. *Filaments* conjoined, as in the diadelphous flowers, longer than the under lip, ascending, towards the apex distinct, the upper shortest.

The leaves, and indeed all parts of the plant, are delightfully fragrant, they are frequently eaten with bread and butter, also bruised and put into country beer, cool tankards, &c. being an excellent substitute for Borage.

5. P. *strobiliferus. Roxb.*

Annual, erect, four-sided. *Leaves* long-petioled, cordate, serrate, hairy. *Spikes* panicled, terminal, compact, strobiliform. *Lower lip* of the calyx short, and truncated. *Nectary*, scarcely any.

Katu-Kurka. *Rheed. Mal. x. t.* 90.

Lavendula *carnosa. Willd.* iii. 62.

It is annual, a native of the most shady clifts of the rocks, among the Circar mountains. It flowers during the wet and cold seasons.

Stem annual, erect, with few or no branches, four-sided, hairy, two feet high. *Leaves*
III. 24 opposite, spreading, petioled, broad-cordate, obtusely serrate, fleshy, rugose, hairy; about two or three inches long and two broad; there are generally tufts of small leaves in the axills of the larger. *Spikes* terminal, often panicled, peduncled, imbricated until the flowering time, with four rows of bractes. *Bractes* oval, considerably longer than the unexpanded flowers, ciliate, spotted on the outside with small reddish dots. *Flowers* pretty large, beautiful, of a bluish purple. *Calyx* two-lipped; *upper lip* ovate, shutting down over the seeds like a lid, as soon as the flower drops; the *under lip* is short and truncate. *Corol; tube* compressed; the *upper* one short, erect, slightly three-toothed, the *under lip* is long and concave, in it the stamens rest. *Nectary* a scale, or lid, covering the lower half of the germ, issuing from the under side.

SCUTELLARIA. Schreb. gen. N. 989.

Calyx with the mouth sub-entire, after inflorescence closed with a lid.

1. S. *indica. Willd.* iii. 175.

Annual. *Leaves* petioled, round-cordate, crenate. *Racemes* terminal, before the flowers expand imbricated with opposite, one-flowered, lanceolate, bractes of the length of the peduncles only.

Exclude *Serratula amara. Rumph. Amb.* xv. *t.* 170. *f.* 1. which I consider a *Gratiola.*

A native of the Moluccas, in the Botanic garden at Calcutta; it flowers during the cold season.

2. S. *peregrina. Willd.* iii. 174.

Herbaceous. *Stem* and *branches* four-sided. *Leaves* cordate, serrate, smooth. *Racemes* terminal, long, secund. *Bractes* petioled, ovate, entire, as long or longer than the calyx.

A native of Nepal. In the Botanic garden at Calcutta, it blossoms during the cold and hot seasons.

III. 25

COLEBROOKIA. Smith.

Aggregate. *Common perianth* imbricated; *proper* beneath, five-cleft. *Corollets* one-petalled, irregular. *Germ* superior, four-lobed; *lobes* one-seeded; *attachment* inferior. *Seeds* four, naked. *Receptacle* naked.

1. C. *ternifolia.*

Shrubby, erect. *Leaves* three-fold, lanceolate, serrulate.

A native of Mysore, from thence the seeds were sent by Dr. Buchanan to the Botanic garden at Calcutta, where the shrubs blossom in February and March.

Trunk (in seven years old plants) short, thick, and woody. *Bark* light-brown, and pretty smooth. *Branches* three-fold, ascending; *young shoots* downy; height of the whole plant from five to eight feet. *Leaves* three-lobed, petioled, drooping, lanceolate, serrate, soft, with much very fine down, from four to six inches long, and from one to two broad. *Petioles* round, very downy, about an inch long. *Panicles* terminal, erect, composed of three-fold, cylindric aments, closely covered with numerous fascicles, of most minute, aggregate, white flowers, on a naked, flat, common receptacle, surrounded by a from ten to twenty-leaved common calyx,

or involucre. *Calyx* deeply five-parted; *divisions* subulate, nearly as long as the corol, clothed with much, long, soft, fine, white wool. These divisions lengthen much, and become more woolly by the time the seeds are ripe, giving to the aments, or ramifications of the panicle, a much larger and more woolly appearance than when in blossom. *Corol* monopetalous. *Tube* short. *Border* four-parted; *upper divisions* emarginate; *under* three-parted, with the middle segments longer, and broader. *Filament* short. *Anthers* small, hid in the tube of the corol. *Germ* four-lobed, hairy. *Style* twice the length of the corol, half two-cleft, and the rest seems composed of two portions, as in *Perilla*. *Stigmas* two, acute. *Pericarp* none. *Seeds* four, obovate, hairy, adhering to each other, and to the calyx, the long, woolly segments of which readily carry them with the wind to a great distance. Page Carey Ed. III. 26

2. C. *oppositifolia.*

Leaves opposite, broad-lanceolar, crenate.

A native of Nepal, from thence Dr. Buchanan sent the seeds to this garden, where the plants thrive well, and blossom in February.

Trunk short, soon dividing into many nearly erect branches, covered with ash-coloured bark, while young four-sided, with rounded angles, and very downy. *Leaves* opposite, decussate, short-petioled, broad-lanceolar, crenate, very soft and downy, and considerably wrinkled. *Stipules* none. *Panicles* terminal, with the *primary* branches opposite, supporting many cylindric, amentaceous spikes of nearly the same length. *Calyx; common perianth* many- (from four to twelve) flowered, many- (from eight to ten) leaved, imbricated, permanent. *Proper perianth* five-cleft; *divisions* filiform, hairy, the length of the tube of florets, their apices coloured, and less hairy. *Corol; universal* equal; *proper* one-petalled. *Tube* gibbous, border four-parted, the middle lobe of the lower division large, and nearly round, the upper broader and emarginate, unequal, remote. *Filament*, scarcely any. *Anthers* minute, hid in the mouth of the corol. *Germ* four-lobed. *Style* twice the length of the corol. *Stigma* two cleft, acute. *Pericarp* none. *Seeds* four, lodged in the bottom of the enlarged hairy, proper perianth. *Receptacle* naked, flat.

PRASIUM. Schreb. gen. N. 992.

Gen. Char. *Berries* four, one-seeded. *Embryo* erect, without perisperm.

P. *melissifolium. R.*

Perennial, scandent. *Leaves* opposite, petioled, ovate, serrate. *Flowers* sessile, sub-verticelled. III. 27

Hursmun the vernacular name in Silhet, where it is indigenous in the forests, flowering about the beginning of the rains. The seed ripens in September.

It is a plant of very slow growth, at least in the Botanic garden at Calcutta, between three and four years have only given one of a few inches in height. Though in Silhet, they are long, weak, scandent, or leaning, with four-sided, villous shoots.

Flowers crowded in the axills, large, drooping, yellow and villous. *Calyx* five-parted; *divisions* nearly equal, acuminate; as the berry advances to maturity, it splits into two; one two-parted, the other three parted; *upper lip* of the corol shorter and slightly emarginate; *under* broad, three-lobed, the middle one much longer. *Anthers* two-lobed, lateral. *Germ* four-lobed; *lobes* one-seeded; *attachment* sub-superior. *Style* about as long as the stamina and corol. *Stigma* bifid. *Berries* four, when all come to maturity, which is common, bright red, of the size of a small pea, convex on the outside, angular on the inner, pulp succulent, scarlet coloured. *Seed* single, conform to the berry, covered with a single thin white integument. *Embryo* erect, without perisperm. *Cotyledons* unequal, the *inner one* large, with a concavity in the exterior, lower half, for the reception of the small, oval, lenticular one.

DIDYNAMIA ANGIOSPERMIA.

OROBANCHE. Schreb. gen. N. 1045.

Calyx from bifid to four or five-cleft. *Corol* irregular. *Stigma* two-lobed. *Capsules* one-celled, two-valved, many-seeded.

1. O. *indica. Buch.*

Ramous, hairy. *Bractes* tern. *Calyx* sub-unilateral, five-cleft. *Upper lip* of the corol two lobed; the *under* one three-parted; *anthers* woolly, two-lobed; *lobes* calcarate. III. 28

Found by Dr. Buchanan in blossom in January in tobacco fields near Calcutta, adhering to the roots of the plants.

Root fibrous, some portion thereof adhering to the roots of *Nicotiana Tabacum*. *Stem* ramous, with a scale at the ramifications only; from six to twelve inches high, round, hairy, sometimes coloured, thickness varying from that of a goose-quill, to that of the finger; the lower half branchy, the upper half leaning. *Flowers* numerous, round the upper half of the branches, forming dense, sub-clavate spikes, they are pretty large and blue. *Bractes* three-fold, one-flowered, hairy. *Calyx* one-leaved, five-cleft, hairy, open to near the base on the inside, where the flower presses on the branch; *divisions* subulate, half the length of the corol. *Corol* tubular, villous, the *upper lip* two-lobed, the under one three. *Filaments* smooth, erect just at the base. *Anthers* two-lobed, the pairs united by woolly fibres, the lobes ending in a sharp horn-let. *Germ* ovate. *Style* rather longer than the filaments. *Stigma* of two, larger, fleshy lobes, with a perforation between them. *Capsule* ovate oblong, two valved, one-celled. *Seeds* very numerous, adhering to four longitudinal ridges on the inside of the capsule.

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2. O. *acaulis. Roxb.*

Stemless. *Flowers* crowded into irregular heads, immediately on the roots. *Corol* five-parted, laciniate; *anthers* single, each of the inner pair augmented with a large recurved oval-gland. *Stigma* peltate.

Found growing on the root of the China sugar-cane, in the Botanic garden at Calcutta, and in full blossom in September.

Root, I suspect annual; of many thick, firm fibres, adhering to the roots of the China sugar-cane. *Stem* none. *Flowers* numerous, short-peduncled, collected into a large, dense, fascicle, even with the surface of the earth, very large; colour, a beautiful lively purple.
III. 29 *Peduncles* short, round, smooth, one-flowered; *bractes* a triangular, fleshy one, embracing the base of one or more peduncles, uniting them into a crown close to the root. *Calyx* one-leaved, length of the tube of the corol, fleshy, simple, opening on one side, or dividing into two unequal portions, on the outside tinged with red, on the inside white. *Corol* with the tube obliquely clavate-campanulate, smooth in every part; inside yellow; *throat* contracted and triangular; *border* five-parted, the capsule I have not seen yet, the divisions are nearly equal and about as long as the tube, margins laciniate. *Filaments* smooth. *Anthers* a larger, oblong, white gland is attached to the base of the inner pair which appears like a second anther. *Germ* ovate. *Style* rather longer than the stamens, curved, smooth. *Stigma* peltate, very large, somewhat three-lobed, glandular, slightly villous. *Capsule* ovate, one-celled, two-valved, with two pair of ramous receptacles, to which the numerous, very minute seeds adhere.

3. O. *pedunculata. Roxb.*

Smooth. *Stem* simple. *Flowers* long-pedicelled. *Calyx* spathiform. *Corols* five-parted; *filaments* naked. *Anthers* adhering by pairs, one of the pairs with a long fleshy appendage. *Stigma* cordate, peltate.

A native of Bengal; it appears during the rains, growing upon the roots of *Andropogon muricatus.*

Stem short; it may be called the common peduncle of a raceme, which rises only an inch or two above the surface of the earth, clothed with a few tapering fleshy scales or leaves. *Peduncles* as long as the stem, round, smooth, erect, one-flowered. *Bractes* no other than the solitary triangular, one-flowered scales, or leaves of the stem. *Flowers* very large. *Tube* yellowish. *Border* deep, lovely violet. *Calyx* one-leaved, spathiform, opening by a single longitudinal slit on the interior side, fleshy, smooth on both sides, when young tinged with red, afterwards of a pale yellowish white, replete with a clear clammy, liquor. *Corol* with an inflated,
III. curved, yellow tube, as long as the calyx. *Border* five-parted; *divisions* nearly equal, and of a
30 round reniform shape, with the margins finely dentate; the upper two less deeply separated, of such a charming deep violet that no artist can possibly do justice to the brilliancy of this flower. *Stamens* hid within the tube. *Filaments* nearly equal, smooth, the interior pair recurved over the posterior. *Anthers*, all the four firmly connected, the interior pair supported by the posterior pair of filaments; enlarged by a long horizontal fleshy appendage, into which the filaments are inserted. *Germ* ovate. *Style* shorter than the tube of the corol. *Stigma* broad-cordate, peltate. *Capsule* ovate, one-celled, two-valved. *Seeds* very numerous, very minute. *Receptacles* two pair, adjoined to the opposite sides of the capsule, ramous.

AEGENETIA. Roxb.

Calyx; spathe one-leaved. *Corol* campanulate. *Capsule* one-celled, with various convolute receptacles; *seeds* numerous.

A. *indica. Willd. iii.* 347. *R. Corom. pl.* 1. *No.* 91.

Tsjem Cumulu. *Rheed. Mal.* xi. *t.* 47.

Orobanche *Aegenechia. sp. p.* 883.

A small, rush-like, naked, annual plant, a native of the hilly parts of the Circars.

Root a number of fleshy fibres, smooth, perfectly naked, intricately interwoven. *Scales* several, straight, round, except immediately at their base, where each is involved in a small sheath, about a foot long, one-flowered. *Leaves* none. *Flowers* large; of an elegant purple colour. *Calyx*; *spathe* oblong, pointed, opening length ways on one side. *Corol* one-petalled, with the bottom of the tube erect, pitcher-formed above, bent out through the spathe, horizontally gibbous; *border* five-parted; divisions equal, rounded. *Filaments* four. *Anthers* twin,
III. united by pairs. *Germ* ovate. *Style* bent to correspond with the form of the corol, and the
31 length thereof. *Stigma* headed. *Capsule* ovate, pointed, of the size of a filbert. Although I have examined it in all stages, yet I have never been able to fix upon any determined internal structure; there are a number of convoluted lamina throughout, between these are lodged innumerable, most minute seeds, like those of the *Orchideæ.*

BUCHNERA. Schreb. gen. N. 1035.

Calyx five-cleft. *Tube* of the corol long; *border* from four to five-cleft, unequal. *Capsule* two-celled, two-valved; *seeds* numerous.

1. B. *asiatica. Willd.* 337.

Erect, annual, four-sided. *Leaves* sessile, opposite, and alternate, linear, scabrous, entire. *Segments* of the lower lip of the corol oval, and rather acute.

Kalu polapen. *Rheed. Mal.* ix. *t.* 66.

A small erect annual, a native of pasture ground, or such as has been lately in culture, appearing and flowering during the wet season.

Stem erect, from six to eighteen inches high, four-sided, scabrous. *Branches* one or two pairs, opposite. *Leaves* sessile; below opposite, above alternate, linear, erect, afterwards a little recurved, scabrous, about an inch long and one-eighth broad, those towards the extremities are very small, which makes them (the extremities) more like long spikes, than the extremities of the branches. *Flowers* axillary, solitary, sessile, of a middling size, white. *Branches* two, pressing on the calyx, laterally lanceolate. *Calyx* five-parted, striated, scabrous. *Corol; tube* rather longer than the calyx, curved at the apex; the *border* flat, two-lipped; *upper lip* broad, emarginate; the *under* one three-parted. *Capsule* covered by the calyx, opening at the apex; *receptacle* columnar. Page Carey Ed.

There is a variety with exceedingly bright red flowers. Cattle do not like them. III.

2. *B. euphrasioides. Vahl. Symb.* iii. 81. *Willd.* iii. 338. 32

Annual, erect, ramous, four-sided and scabrous. *Leaves* opposite and alternate, linear, scabrous, with short stiff bristles. *Corol* clavate. *Capsule* cordate, hid in the scabrous calyx.

A native of Prince of Wales' Island and the islands eastward of the Bay of Bengal.

ACANTHUS. Schreb. gen. N. 1065.

Calyx two-leaved, bifid; (in the East India species it consists of three pairs of leaflets). *Corol* one-lipped. *Anthers* bearded. *Capsule* two-celled, opening with elasticity across the partition. *Seeds* few.

1. A. *ilicifolius. Willd.* iii. 398.

Shrubby, armed. *Leaves* oblong, sinuate, spinous, dentate. *Spikes* terminal.

Aquifolium indicum. *Rumph. Amb.* iv. *t.* 71. *f.* 1.

Harikusa, the Sanscrit name.

Beng. Harcooch Kanta.

Paina schulli. *Rheed. Mal.* ii. *t.* 48.

A common shrub in and on the edges of salt or brackish lakes, marshes, &c. Flowers all the year on the coast of Coromandel. In Bengal during the rains.

Roots ramous. *Stems* many, erect; *branches* few; *bark* smooth. *Prickles* stipulary, fourfold, short, but very sharp. *Leaves* opposite, short-petioled, oblong, scolloped, waved, spinous, dentate, polished on both sides, of a firm texture, from four to six inches long, and about two broad. *Spikes* generally terminal, though sometimes from the axills also erect. *Flowers* solitary, opposite, large, blue, inodorous. *Bractes*, a single cordate, pointed one below each flower, it presses on the calyx, and seems a seventh leaflet thereof. *Calyx* as in the family. *Corol* many times longer than any of the leaflets of the apex, three-toothed. *Filaments* rigid. *Anthers* pressed closely together, linear, very hairy. *Capsule* oblong, ovate, smooth, size of an acorn, two-celled, two-valved, &c. as in *Barleria* and *Justicia*. *Seeds* two in each cell, obliquely cordate, compressed. III. 33

2. A. *madaraspatensis. Willd.* iii. 400.

Herbaceous, spreading flat on the ground. *Leaves* quatern, sessile, elliptic, sometimes remotely serrate. *Flowers* axillary, solitary, sessile. *Exterior calyx* of four pair of unequal, cuneate, ciliate, leaflets; the *inner* one of two pair, not ciliate.

A native of Coromandel, where it flowers in the cold season.

THUNBERGIA. Schreb. gen. N. 1058.

Calyx double; the exterior one two-leaved. *Corol* irregular, one-petalled. *Germ* two-celled; *cells* two-seeded; *attachment* interior. *Capsules* with a long ensiform beak, two-celled, opening with elasticity contrary to the partition. *Seeds* solitary or paired. *Embryo* concave, with unequal cotyledons, and no perisperm.

1. T. *fragrans. Willd.* iii. 388. *Corom. pl. N.* 67.

Shrubby, twining, round. *Leaves* opposite, narrow.

Teling. Zeamandaree Tiga.

This plant is common in hedges, amongst bushes, &c. on the banks of water courses about Samulkota. I have not met with it elsewhere. Flowers during the wet and cold seasons; when cultivated it flowers all the year round.

Root, consisting of many thick, woody fibres. *Stem* and *branches* twining, woody, of considerable extent, two or three fathoms, jointed, and swelled there from the insertions of the leaves or their cicatrices, round; *bark* of a light ash-colour; *young shoots* downy. *Leaves* opposite, petioled, narrow, cordate, acute, behind toothed and slightly lobate, or angular, three-nerved, slightly scabrous, about three inches long by one and a half broad. *Petioles* about three quarters of an inch long, channelled, bent in various directions. *Stipules* none. *Peduncles* axillary, solitary, one-flowered, round, clubbed, downy; from one to two inches long. *Bractes* none. *Flowers* large, pure white. *Perianths* as in the genus, except that the leaves of the interior calyx are acute, and many-nerved. *Corol* salver-formed. *Tube* compressed, enlarged about the middle, a little hairy, longer than the interior calyx, bent to one side with a curve; *border* flat, five-parted; *divisions* equal, obovate, with their extremities lobed, and generally irregularly three-toothed; shorter than the tube. *Germ* superior, four-lobed, two-celled, with two ovula in each cell, attached to the middle of the partition. *Style* the length of the tube. *Stigma* funnel-shaped, two-lobed; *lobes* obcordate. *Capsule* sub-globular, flat, beaked, two-celled, opening from the base with an elastic jerk. *Seed* solitary, one in each cell, the other seldom or never ripens, round, rugose, with a large cavity, which penetrates two-thirds of the seed. III. 34

Obs. Dr. König on first discovering this plant, thought it a new genus and called it *Roxburghia rostrata*, but as soon as he saw the Supplement of the younger Linnæus, he found its

Page Carey Ed. character agree so well with that of *Thunbergia*, that he hesitated not to declare it a species of that genus.

The whole plant possesses a peculiar sort of agreeable fragrance, which with the beauty of its flowers, entitles it to a conspicuous place in the flower gardens.

2. T. *grandiflora. Roxb.*

Perennial, twining. *Leaves* cordate, angled. *Corol* campanulate, no inner calyx. *Anthers* bearded and clavate.

Hind. and *Beng.* Meel-luta.

Found amongst bushes and wild uncultivated places near Calcutta. Flowering time, the rainy season.

III. 35 *Root* perennial, somewhat tuberous. *Stem* woody, twining up high trees, &c.; *young shoots* a little hairy, and slightly four-winged. *Leaves* opposite, petioled, spreading, cordate, often angle-lobed, pointed, from five to seven-nerved, a little scabrous from small stiff white hairs on both sides; *floral leaves* of the racemes small, otherwise like the rest. *Petioles* erect, nearly as long as the leaves, swelled near the base, channelled, scabrous. *Stipules* none. *Peduncles* axillary, solitary, or paired; or in brachiate pairs, *i. e.* two or three pairs on terminal racemes, which if not supported, become beautifully bowing, like elegant festoons. *Peduncles* of the axillary flowers, and pedicels of the raceme, round, somewhat clavate, as long as the petioles, one-flowered. *Flowers* very large, being about four inches broad when expanded, colour a beautiful light blue. *Bractes* none. *Calyx; spathe* two-valved, obliquely-oblong, the under margins being more rounded and open; the upper almost straight, and slightly united, sometimes their whole length, though in general only near the apex, striated, pointed, a little hairy, and marked with small black dots, they are about as long as the tube and throat of the corol. *Corol* one-petalled, campanulate, sitting on a nectarial ring. *Tube* short and conical; *throat* ample, with a long, vaulted concavity on the upper side, where the stamens and style are lodged; on the opposite side is a large corresponding convexity, which is elegantly streaked with deeper and lighter blue. *Border* five-parted; *divisions* nearly round, the superior two erect, the inferior ones expanded. *Nectary* a large lobate body, surrounding the base of the germ, the corol inserted into it. *Stamens* within the throat. *Filaments* four, inserted on the mouth of the tube, interior pair much curved, and although longer than the other pair, yet from the curvature, their anthers are not more elevated than those of the other, or posterior pair; oblong, ovate, compressed, rugose. *Anthers* converging, equal, linear, erect, two-celled, margins of the cells bearded, as in *Acanthus;* each of the cells of the III. 36 interior anthers, armed with a curved, sharp, rigid, white spur, exterior cell of the inner anthers armed in the same manner. *Germ* conical, somewhat four-sided. *Style* straight, length of the stamens. *Stigma* large, with a most uncommon perforation, which I compare to an inverted crescent, with a handle affixed to the centre of its concave side. *Capsule* globular, breaked, two-celled, two-valved, opening from the apex. *Seed* when all come to maturity, two in each cell, roundish, compressed with a notched margin, tubercled and convex on the outside, concave and smooth on the inner.

It is one of the most elegant, showy, twining plants I have met with, and richly deserves a conspicuous place in the shrubbery.

BARLERIA. Schreb. gen. N. 1051.

Calyx of two dissimilar pairs of leaflets. *Corol* somewhat funnel-shaped. Two of the stamina minute. *Capsule* two-celled, two-valved, bursting with elasticity contrary to the partition.

1. B. *prionites. Willd.* iii. 376.

Shrubby; thorns axillary, four-cleft. *Leaves* broad-lanceolate, spinous, pointed, smooth, entire.

Kooroontuka, the Sanscrit name.

Beng. Kanta-jatee.

Coletta veetla. *Rheed. Mal.* ix. *t.* 41.

Hystrix frutex. *Rumph. Amb.* vii. *t.* 13.

Melampyro, &c. *Pluck. Alm. t.* 119. *f.* 5.

Teling. Mooloo govinda.

Is one of the most common, and at the same time elegant, small, shrubby plants in India; every soil and situation suits it equally well, and it is in flower all the year round.

Stem short, erect. *Branches* numerous, opposite, erect, round, smooth; the whole plant two or three feet high. *Thorns* or rather *prickles* axillary, generally about four, straight, III. slender, sharp. *Leaves* opposite, decussate, short-petioled, oblong, waved a little, mucronate, 37 smooth. *Flowers* axillary, generally solitary, sessile, large, yellow. *Bractes* uncertain, when there are no thorns on the same axill there are two, opposite, linear, daggered, besides an undetermined number of very small ones. *Stamens*, the long pair projecting, their filaments compressed. *Stigma* entire, cylindric, open, pitted. *Capsule* conical, two-seeded, one seed in each cell.

2. B. *buxifolia. Willd.* iii. 377.

Shrubby, spreading. *Spines* simple, axillary, twin. *Leaves* round, with spinous joints. *Flowers* not long, sessile between the twin spines.

Cara-schulli. *Rheed. Mal.* ii. *t.* 47. bad, if for this plant.

A native of Malabar, Mysore, &c. from the latter country the seeds were sent by Dr. Buchanan in 1800 to the Botanic garden at Calcutta, where the plants thrive well, and are

in blossom during the hot season.

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Stems scarcely any, but several slender, variously bent, ramous, spreading branches; *young shoots* round and downy. *Leaves* opposite, sub-sessile, nearly round, entire, spinous, pointed, villous on both sides; about half an inch long, and nearly as broad. *Spines* in axillary pairs longer than the leaves, simple, slender, white and sharp, when they are in opposite axills they form a verticel of four, but it is only the older branches on which they are found in both. *Flowers* solitary, sessile in the forks of the spines, large, of a beautiful pink tinged with violet. *Stamens* the two with fertile anthers considerably longer than the tube of the corol, and in this species there are three short sterile filaments. *Capsule* elliptic, with two villous seeds in each cell.

3. B. *cristata. Willd.* iii. 378.

Unarmed, shrubby. *Leaves* sessile, broad, lanceolate, entire. *Flowers* axillary, sessile, one or two exterior leaflets of the calyces ciliate.

III. 38

Found in gardens about Calcutta, and wild in the forests of Silhet. It is a large, very ramous shrub. Flowering time the cold season, during which period it is uncommonly gaudy; *young shoots* round, jointed, hairy. *Leaves* opposite, sessile, broad-lanceolate, entire, hairy, from two to three inches long. *Flowers* axillary, sessile, one or two, rarely more than three, large, of a beautiful bright blue. *Bractes* from two to three, subulate, hairy. *Calyx* four-leaved; *exterior pair* hairy, oblong and ciliated with strong bristles; *interior pair* much smaller, lanceolate and hairy. *Corol, tube* oblong, outside downy; *border* two-lipped, *upper lip* four-parted; the *under* one broader, but shorter and entire. *Nectary* a two-lipped cup, embracing the lower half of the germ. *Filaments* as in the family, with the addition of a small, fifth sterile one, all hairy. *Anthers* two-parted from below. *Styles* rather longer than the long filament. *Stigma*, enlarged, perforated between two short rounded lips.

3. B. *ciliata. Roxb.*

Unarmed, shrubby, with few long spreading branches. *Leaves* lanceolate. *Flowers* axillary, sessile, solitary or in pairs.

A native of the interior parts of Bengal and from thence sent by Dr. W. Carey, to the Botanic garden at Calcutta, where it blossoms about the beginning of the cold season.

Stems scarcely any, but several long slender diffuse, straggling branches and branchlets, which makes it rather a naked plant, when compared with the species formerly described by me under the name B. *cristata*, though I must now acknowledge the species before me agrees better with Osbeck's figure than that does. *Leaves* opposite, sub-sessile, lanceolate, frequently recurved, a little hairy, entire, about two or three inches long, and half an inch broad. *Flowers* axillary, solitary or in pairs, large, pink, with a slight tinge of purple. *Bractes* ensiform, often ciliate. *Calyx, leaflets* two pairs; *exterior pair* lanceolate, nervose, ciliate; *inner pair* small and ensiform. *Corol, upper lip* of four broad, entire divisions; the *under* one slightly emarginate. *Capsule* with one or two hairy seeds in each cell.

III. 39

4. B. *dichotoma. Roxb.*

Unarmed, shrubby. *Leaves* petioled, broad-lanceolar. *Flowers* collected in the axills, on short recurved dichotomous spikes; exterior pair of the leaflets of the calyx ciliate.

Beng. Sada-jatee.

Found in a Hindoo's garden near Calcutta, where indigenous I could not learn. Flowering time the cold season.

Trunk scarcely any, but numerous opposite and decussated branches, and somewhat hairy branchlets; height from four to eight feet. *Leaves* opposite, petioled, lanceolate, oblong, entire, somewhat hairy on both sides. *Flowers* large, pure white, collected on very short, solitary, dichotomous, recurved, axillary spikes, two or three standing erect on the upper or convex side of each spikelet, with a single one in the fissure; they are all embraced by several, linear, pretty long bractes. *Calyx*, &c. exactly as in *Barleria cristata.*

5. B. *cærulea. Roxb.*

Shrubby, unarmed, straight. *Leaves* sub-sessile, oblong, waved. *Flowers* in imbricated, axillary, and terminal fascicles. *Exterior leaflets* of the calyx ovate, scollopped and ciliate.

Beng. Dasee.

Justicia fasciculata of Dr. König's Mss.

Barleria strigosa. *Willd.* iii. 379.

A middle-sized, erect, flowering shrub, cultivated in our garden, for the sake of its numerous, beautiful, large, light blue flowers. It is a native of the shady moist vallies, up amongst the mountains, through the Circars, also of Bengal. Flowering time the cold season.

Roots branchy. *Stems* and *branches* many, erect, round, jointed; swelled above the joints, a little scabrous, from two to four feet high. *Leaves* opposite, short-petioled, oblong, pointed, waved, a little scabrous, from four to five inches long, and from two to two and a half broad. *Spikes* short, axillary and terminal, recurved, bearing the flowers on the upper or convex side. *Bractes* one or two to each flower, placed on the outside, oblong, pointed, nervous, waved, dentate, ciliate. *Flowers* large, blue, placed alternately in two rows. *Calyx* four-leaved; *exterior pair* large, pointed, dentate, ciliate, waved; *inner pair* lanceolate, small. *Nectary* a cup surrounding the base of the germ. *Filaments*, a fifth sterile, between the short pair of stamens. *Capsule* little more than half the length of the exterior calyx. *Seeds* two in each valve.

III. 40

6. B. *longiflora. Willd.* iii. 379.

Unarmed, shrubby. *Leaves* ovate-cordate, entire, sericeous. *Exterior leaflets* of the calyx cordate, scariose. *Tube* of the corol long.

A singularly looking, shrubby species, a native of hills, and the lower region of mountains.

Page Carey Ed. *Stem* very short, woody ; *bark* whitish ; *branches* very numerous, below opposite, above alternate, spreading, from two to four feet high. *Leaves* opposite, petioled, cordate, entire, covered with much soft white down, from one to two inches long, and one or one and a half broad. *Flowers* axillary, solitary, alternate, short-peduncled, white, in the opposite axill is a branchlet, the flowers occupying those axills on the upper side, and the branchlet those on the under. *Bractes* two, opposite, linear-lanceolate, revolute. *Calyx* four-leaved ; the *exterior* two opposite, large, cordate, reticulated, chaffy, waved ; the *interior* two also opposite, but many times smaller, lanceolate and concave. *Corol ; tube* very long, from four to six inches, filiform, bent a little ; *segments* of the border flat, equal, obcordate. *Anthers*, the superior pair somewhat sagittate ; the inferior small and two-lobed. *Stigma* clavate, somewhat three-
III. sided, funnel-formed, glutinous. *Seeds* four, two in each cell, silky.
41 *Obs.* Dr. König's bractes are my exterior leaflets of the calyx, but his *flores terminales* I cannot account for, and there is no mistake in the plant, for I was with him when he discovered and first described it. It looks well while young, but afterwards it has rather a scraggy appearance ; I have had it in my garden many years.

RUELLIA. Schreb. gen. N. 1050.

Calyx five-parted. *Corol* somewhat campanulate, by pairs. *Capsule* two-celled, two-valved, bursting with elasticity contrary to the partition.

1. R. *infundibuliformis. Roxb.*

Shrubby. *Leaves* oblong, four-fold. *Spikes* four-sided. *Bractes* three-fold. *Calyx* five-leaved. *Corol* with unilateral border ; *seeds* scaly.

Justicia infundibuliformis. *Willd.* i. 99.

Manja Kurini. *Rheed. Mal.* ix. *t.* 62.

A pretty large, erect, ramous shrub ; commonly found cultivated in the Pagoda gardens, where it flowers all the year round. *Leaves* four-fold and staid at the joints of the branchlets, spreading, petioled, oblong, pointed, waved, running down the petiole, slightly pubescent, about two or three inches long, and one and a half broad. *Petioles* channelled, about an inch long. *Spikes* axillary, erect, long-peduncled, four-sided ; *angles* sharp, from the sharp points of the bractes always ending there. *Bractes* oblong, jointed, keeled, ciliate, one-flowered. *Bractioles* two, subulate, placed on each side of the calyx. *Flowers* numerous, pretty large, of a bright orange colour. *Calyx* five-leaved, the three exterior largest. *Corol ; tube* filiform, curved like the letter S ; *border* irregularly five-cleft. *Filaments* four, short, curved, two of them shorter. *Anthers* oblong, within the tube. *Pistillum* as in the genus. *Seeds* two in the cell,
III. with chaffy, torn scales.
42 2. R. *Zeylanica. Kön. Mss. B. H.*

Shrubby, scandent. *Leaves* cordate. *Racemes* terminal, becoming lateral, round. *Capsules* clavate ; *seeds* one or two in each cell, with a thick double, dentate margin.

Valli upu dali. *Rheed. Mal.* ix. *t.* 45.

A native of Coromandel, and in flower and fruit great part of the year. *Stem* not easily distinguished from the innumerable branches, which spread or climb in every direction to a very considerable extent, and by age become ligneous ; the parts that rest on the ground strike root at the joints ; *young shoots* pretty smooth and somewhat four-sided. *Leaves* opposite, petioled, cordate, entire, rather obtuse, pretty smooth, texture soft, from one to three inches long. *Petioles* toward the apex winged ; length one-third that of the leaves. *Racemes* terminal, but becoming lateral by the time the seeds are ripe, as the branches lengthen on one side thereof, from six to twelve inches long, slightly incurvate, round. *Rachis* four-sided. *Flowers* short-pedicelled, solitary, rather remote, large, white or pale blue purple ; for there are two varieties constituted by the colour of the flowers only. *Bractes* tern, at the base of each pedicel, and one opposite to these on the opposite side of the rachis, small, triangular, permanent. *Calyx* to the base five-cleft. *Segments* ensiform, acute ; *corol* with short tube, compressed, campanulate throat, and subequal border, of five nearly equal, sub-rotund segments. *Filaments*, the pairs united below the middle. *Germ* sitting in a fleshy nectarial cup, oblong, two-celled, with two seeds in each. *Stigma* rather large, slightly two-lobed, umbilicated. *Capsules* clavate, villous, a full inch long. *Seeds* one or two in each cell, rugose, with thick, double, dentate margins. The rest as in other *Acanthoideæ*.

3. R. *racemosa. Roxb.*

III. Herbaceous, erect, the tender parts villous. *Leaves* petioled, broad-lanceolate, rather
43 blunt, entire. *Racemes* terminal. *Corol* cylindric, campanulate ; *divisions* of the border equal and roundish. *Anthers* twin. *Capsule* linear, oblong, many-seeded.

Found by Dr. Hunter, and Mr. Roxburgh in Pulo Pinang, under the shade of trees, in flower in June.

4. R. *comosa. Roxb.*

Shrubby, ramifications crowded, very hairy. *Leaves* ovate-oblong, serrate, cuspidate, one much larger. *Spikes* axillary, imbricate, with decussate, ciliate, cuneiform bractes. *Calyx* two-cleft. *Corol* obliquely campanulate.

A native of the Molucca Islands, from thence introduced into the Botanic garden at Calcutta, where in seven years the plants grew into large, very ramous, high, spreading bushes and then blossomed for the first time during the rainy season.

Trunk scarcely any. *Branches* numerous, much divided, crowded, spreading in every direction. *Young shoots* round, hairy, and swelled at the joints. *Leaves* opposite, long-petioled one of the pairs much smaller, ovate, oblong, serrate, cuspidate, very hairy, length of the

largest about five inches by two and a half, and its companion scarcely half the size. *Spikes* axillary, solitary, short-peduncled, scarcely so long as the petioles, imbricated with decussate, ciliate, cuneiform, cuspidate *bractes*, those of the calyx opposite, similar in shape, but much smaller. *Flowers* large, purple. *Calyx* deeply two-cleft, very hairy; the *upper segment* three-toothed; the *under* one two-toothed. *Corol* of an oblique, narrow, campanulate form, with its border divided into five, short, broad, emarginate, nearly equal, somewhat crenulate segments. *Capsule* lanceolate, hairy, four-seeded. Page Carey Ed.

5. R. *flava. Roxb.*

Shrubby, smooth, petioled, oblong, ventricose, tapering most at the base, sub-entire. *Spikes* terminal. *Flowers* narrow, campanulate, sub-equal. III.

A very pretty, small shrub when in flower, found by the Rev. Mr. F. Carey in the vicinity of Rangoon in Pegue, where it is called *Pretchee. Branchlets* straight, smooth, and in the dry specimens tending to be four-sided. *Leaves* opposite, petioled, oblong, ventricose, margins rather uneven, smooth on both sides, six inches long. *Spikes* terminal, crowded with bractes, and larger, yellow, opposite, sessile flowers. *Ruchis* four-sided and smooth. *Bractes* a lanceolate one under each flower and two smaller ensiform ones pressing on the sides of the calyx and longer than its segments. *Calyx* five-parted. *Segments* ensiform. *Corol* irregularly narrow, campanulate. *Border* of five nearly equal, semicircular lobes. *Filaments* the longer pair most ciliate on the outside. *Anthers* linear, and the opposite pairs firmly united. *Germ* oblong. *Stigma* of two very unequal lobes. 44

6. R. *ringens.*

Perennial, creeping or climbing. *Leaves* oblong, ventricose, hairy. *Flowers* axillary, short-peduncled. *Floral leaves* longer than the calyx. *Capsule* clavate. *Seeds* imbricated.

Upu dali. *Rheed. Mal.* ix. *t.* 64. has the divisions of the border of the corol too long and too sharp for my plant.

Is common in thickets, &c. over most part of India, and is in blossom the greatest part of the year. Compare with Vahl's R. *pallida. Symb.* ii. 72.

Stems or *branches* diffuse, climbing or creeping just as they meet with support, woody. *Young shoots* erect, somewhat four-sided, and hairy. *Leaves* opposite, short-petioled, ovate, oblong, entire or slightly scollopped, pale green and hairy on both sides. *Flowers* axillary, solitary, short-peduncled, large; colour, a beautiful pale blue, they expand in the evening and droop in the morning. *Floral leaves*, (bractes,) like the other leaves, but smaller, one on each side of the middle of the peduncle, from their axills other flowers often succeed. *Calyx* with very long, slender, bristle-like, hairy divisions. *Corol* bell-shaped, almost regularly five-parted. III. *Filaments* united by pairs near the base. *Stigma* entire, broad, glandular. *Capsule* club-shaped, with many compressed imbricated seeds in each cell. 45

7. R. *cernua. Roxb.*

Shrubby, erect, polished. *Leaves* opposite, drooping, petioled, ovate lanceolate, acuminate. *Flowers* axillary, sub-sessile. *Bractes* petioled. *Capsule* clavate, many-seeded.

Moretiana. *Rumph. Amb.* iv. *t.* 23. *f.* 1.

Reared in the Botanic garden at Calcutta from seed sent by Dr. Buchanan from Mysore, where the plant is indigenous. Flowering time in Bengal the rainy season.

Root perennial. *Stems* in a cultivated state several, sub-ligneous, erect, round, smooth, swelled immediately above the joints. *Branches* opposite, alternately smaller, sub-erect, smooth, obscurely four-sided, the whole plant about three feet high. *Leaves* opposite, petioled, drooping, alternately smaller, ovate, lanceolate, slightly repand, long, taper, recurved, pointed, smooth on both sides; size very various, the larger often from two to four inches long. *Flowers* axillary, from one to three, sub-sessile, small, pale pink, their insertions surrounded with some opposite pairs of small floral leaves and lanceolate petioled bractes. *Calyx* five cleft. *Corol* campanulate, *lower lip* larger and more deeply coloured, the other four equal. *Stigma* clavate, curved. *Capsule* clavate, many-seeded.

8. *R. patula. Willd.* iii. 364.

Perennial. *Leaves* ovate, scollopped, downy; peduncles axillary, three-flowered. *Filaments* united by pairs, from the middle downwards. *Capsules* clavate, many-seeded. It delights in rubbish, shady corners, &c. in the vicinity of Negapatam. Flowers during the cold season.

Root woody, perennial. *Stems* many, sometimes resting on the ground, rooting, and sometimes nearly erect, very ramous, woody, and round jointed. The younger parts downy, about two feet high. *Leaves* opposite, petioled, ovate, a very little scollopped, waved, downy, somewhat glutinous; about an inch or one and a half long and broad. *Petioles* compressed, downy, half the length of the leaves. *Peduncles* axillary, short, generally three-flowered. *Bractes* leaf like, but smaller, and narrow in proportion. *Flowers* pretty large, very pale blue. *Filaments* united by pairs from the middle downwards. *Stigma* large, particularly the *under lip*. *Seeds* about six in each cell, imbricated, margins woolly. III. 46

The plant has a weak, but pleasant, fragrant smell.

9. *R. hirta. Vahl. Symb.* iii. *p.* 84. *t.* 67.

Perennial, creeping, four-sided, hairy. *Leaves* oblong, crenate, bristly. *Heads* terminal, surrounded with lanceolate bractes. *Capsules* linear.

A native of various parts of India, and found chiefly in shady places. Flowers during the cold season.

Root woody, perennial. *Stem* often creeping, branchy, four-sided, very hairy, from one to two feet long. *Leaves* opposite, sub-sessile, oblong, crenulate, covered with stiff brown hairs, about two inches long and one broad. *Floral leaves* four-fold. *Flowers* terminal, several forming one or more globular heads, large, bluish purple. *Bractes* involucre-like, linear, very

Page Carey Ed. hairy. *Coroll*, divisions of the border equal, obliquely oval, as in the contorted flowers.

There is a variety of this species, with white flowers.

10. *R. latebrosa. Roxb.*

Herbaceous, creeping, round, hairy. *Leaves* oval, sub-sessile, crenate. *Flowers* axillary, solitary, and in terminal, bracted heads; *corol* nearly regular. *Capsule* lanceolate, many-seeded.

A small creeping, herbaceous plant, growing in shady uncultivated places, under bushes, &c. Flowers during the cold and the beginning of the hot season.

III. 47 *Root* perennial. *Stems* several, creeping, round, hairy, from six to twelve inches long. *Leaves* opposite, short-petioled, broad, oval, serrate or notched, hairy, about an inch long, and three quarters of an inch broad. *Flowers* axillary, solitary, sessile, light blue, they are also collected in small, terminal, bracted heads, of from four to six flowers each. *Corol*; *tube* twice the length of the calyx, contracted about the middle. *Capsule* lanceolate, many-seeded.

11. R. *flagelliformis.*

Herbaceous. *Shoots* diffuse. *Radical leaves* petioled, oblong, and obtuse; *cauline* remote, sub-sessile, and nearly round. *Flowers* axillary, crowded, sessile. *Anthers* twin. *Capsule* linear, many-seeded.

A native of the Moluccas.

12. R. *Pavala. Roxb.*

Suffrutex, very ramous, diffuse. *Leaves* ovate, pointed, serrate. *Spikelets* axillary, and terminal, sub-sessile. *Corol* with a regular, five-parted border.

Teling. Pavala.

This plant is in general so like R. *fasciculata*, the flowers excepted, that our description, except that of the flowers, may serve for both.

It is a native of the same places, and flowers during the cold season.

Spikelets terminal, and axillary, sub-sessile, oblong. *Bractes* opposite, oblong, downy, margins slightly fringed with hairs, one-flowered. *Flowers* small, bright, but deep blue. *Corol*; *tube* curved, widening from the base to the top, in the last it is gibbous, &c. *divisions* of the border equal; in the last it is grinning.

The plant has a strong disagreeable smell.

13. R. *bracteata. Roxb.*

Shrubby, straight. *Leaves* ovate, pointed, serrate. *Flowers* axillary, solitary or racemed. III. *Bractes* cordate, chaffy. *Corol* campanulate. *Capsules* two-seeded.

48 A shrubby species, a native of the mountains. *Stems* several, woody, straight, spreading, round, smooth, jointed; length and thickness various. *Bark* light, ash-coloured. *Branches* few, stem-like. *Leaves* opposite, petioled, ovate, serrate, pointed, pretty smooth. *Peduncles* axillary, solitary, one-flowered, or in luxuriant plants they are on small axillary racemes, like leafy branchlets. *Bractes* two, opposite, sessile, cordate, pointed, concave, chiefly veined; within them the proper five-parted perianth is hid. *Flower* white, large. *Corol*; *tube* gibbous; *border* sub-equal. *Anthers* twin, the lower point of each ends in an incurved spur. *Capsule* oval, two-seeded.

14. R. *fasciculata. Willd.* iii. *p.* 1. 369.

Suffrutex, very ramous, diffuse. *Leaves* sub-rhombiform, decurrent, pointed, serrate. *Spikelets* sub-panicled. *Corols* ringent; *tube* gibbous; *anthers* twin.

A small, diffuse, very ramous, under shrub, a native of the hilly country. Flowers during the cold season.

Root perennial. *Stems* and *branches* numerous, and are so intermixed that there is no making a distinction; diffuse, those next the ground strike root at the joints, four-seeded, a little hairy, from one to two feet long. *Leaves* opposite, petioled, oblong, pointed, with the anterior margins serrate, running down to near the base of the petiole, a little downy, from two to three inches long, and from one to two broad. *Spikelets* ovate, small, numerous, panicled, peduncled, axillary, and terminal. *Bractes* lanceolate, imbricate. *Flowers* numerous, small, white. *Corol* grinning; *tube* bellied, contracted at the mouth; *upper lip* short emarginate; the *under* one broader and three-parted. *Filaments* inserted into the mouth of the tube. *Anthers* twin, the *superior pair* oblong, and placed laterally; the *inferior* globular, one above the other.

III. 15. R. *imbricata. Willd.* iii. 366.

49 Perennial, diffuse. *Leaves* long-petioled, obliquely ovate. *Racemes* secund. *Bractes* solitary, reniform, ciliate, many-flowered; *upper segments* of the calyx very hard, lanceolate.

Found wild in shady places in the vicinity of the Botanic garden near Calcutta. It blossoms during the cold season, and its seed ripens in March.

Stem scarcely any, but numerous, sub-opposite, jointed, weak, straggling branches, often resting on the ground, and in that case roots issue from the joints. *Leaves* opposite, long-petioled, one of the pair always considerably smaller, obliquely ovate-oblong, taper-pointed, crenulate-serrate, tolerably smooth on both sides; size very various. *Racemes* axillary, and terminal, short, secund. The reniform bractes, with their flowers occupy the outside, while on the inside are just as many, opposite pairs, of every unequal (sized) floral leaves; in the axills of the largest of these, the alternate, reniform bractes with their flowers are inserted. *Bractes* axillary, solitary, short-peduncled, reniform, clothed with long, soft, glutinous hairs, each embracing from two to six, or more small, white flowers. *Calyx* five-cleft; *upper* division large, rather longer than the bractes, broad-lanceolate, the inferior four subulate, all are hairy, and clammy, like the bractes. *Corol* bilabiate; the *upper lip* bifid, the *under* one-trifid. *Capsule* four-seeded.

16. *R. dependens. Roxb.*

Suffruticose, erect, very ramous. *Leaves* hanging, broad-lanceolate, serrulate. *Spikes* terminal, sessile, crowded, secund, imbricated. *Bractes* lanceolate, ciliate. Page Carey Ed.

A native of Mysore. Flowering time, the rainy season.

Stem, scarcely anything like one, but numerous straight branches with alternate, erect, somewhat four-angled, coloured, smooth branchlets; the height of the whole plant about two feet. *Leaves* opposite, petioled, drooping, alternately smaller, broad-lanceolate, margins entire, most slightly villous underneath, from one to four inches long. *Petioles* with a continuation of the base of the leaf, very various in length, a little hairy. *Spikes* terminal, crowded, sessile, sub-cylindric, secund. *Bractes*, on the back of the spike are two rows, of alternate, bifarious, lanceolate, spinous-pointed ciliate ones; on the floriferous side three similar ones to each flower. *Calyx*, to the base five-cleft; *divisions* unequal, ciliate. *Corol* ringent; *tube* as long as the calyx, gibbous; *upper lip* shorter, smaller and deeply emarginate; the *under* one three-parted, recurved. *Anthers* united by pairs. *Capsule* short, ensiform, with two seeds in each cell. III. 50

17. *R. salicifolia. Willd.* iii. 374. *Vahl. Symb.* 384.

Annual, sub-erect. *Leaves* lanceolate, serrate. *Flowers* sessile, fascicled in alternate axills. *Corols* ringent, erect. *Bractes* lanceolate.

Is very much like *Barleria longifolia*; it is annual or biennial, and a native of the same wet swampy places as that plant. It flowers during the wet season.

Stem towards the base resting on the ground, and there striking root at the joints, above erect, round, smooth, jointed. *Leaves* opposite, sub-sessile, lanceolate, slightly serrate, crenulated, or waved, smooth; about three inches long, and half an inch broad. *Flowers* sessile, from two to six in each alternate axill, light-blue; in the opposite axill there is generally a small branchlet. *Bractes* several, lanceolate, slightly ciliate. *Calyx* five-parted. *Corol* ringent. *Capsules* long, round, smooth. *Seeds* small, very numerous.

18. *R. longifolia. Roxb.*

Herbaceous. *Leaves* verticelled, lanceolate, hairy. *Spines* of the verticells six-fold.

Gecantaca, its Sanscrit name. See *Asiat. Res.* v. *p.* 291.

Beng. Kanta koolika.

Barleria longifolia. *Linn. sp. pl. ed. Willd.* iii. 375.

Bahel-schulli. *Rheed. Mal.* ii. *t.* 45.

Is common in low wet places all over India. Flowering time, the cold season. III. 51

Roots often biennial. *Stems* herbaceous, ascending, or erect, ramous, jointed, a little flattened, hairy, from two to three feet high. *Branches* opposite, like the stem, and also nearly erect. *Leaves*, an exterior, opposite, sessile pair at each joint, within these, and subalternate with the spines, several small ones in a verticel; all are linear-lanceolate; margins often revolute, hairy, I may almost say bristly; size various. *Spines* six in each *verticel*, between the leaves and flowers, awl-shaped, spreading, and a little recurved. *Flowers* verticelled, numerous, sessile, large, of a bright-blue, or in some varieties, rose-coloured. *Bractes* lanceolate, margins and outside bristly. *Calyx* of two pairs of nearly equal leaflets, clothed with soft hair. *Corol* two-lipped; *lips* nearly equal; *upper* two-parted, with the division emarginate; the *under* one three-parted, with the divisions also emarginate, in the under a coloured body like a large oblong anther. *Filaments* connected at the base; second pair larger than usual in the genus. *Anthers* sagittate. *Stigma* subulate, involute, with a fissure on the upper side.

19. R. *hirsuta. R.*

Annual, erect. *Leaves* lanceolar, entire, hirsute. *Flowers* sessile, crowded in both axills. *Bractes* numerous, linear, and with the five acute segments of the calyx very hairy.

A native of Chittagong.

20. R. *obovata. R.*

Annual. *Leaves* short-petioled, from oval to obovate, cuneate, obtuse, hairy. *Flowers* axillary, crowded, sessile. *Bractes* and *calyx* ciliate. *Corol* ringent. *Capsule* cylindric, smooth, many-seeded.

Nir schulli. *Rheed. Mal.* ii, *t.* 46.

Found in moist situations in the province of Chittagong. Flowers about the close of the rains, and the seed ripens in February and March. III. 52

This species certainly agrees much better with Van Rheed's figure above quoted, than the short descriptions of R. *difformis, Suppl.* 289. *Willd.* iii. 374.

21. B. *uliginosa. Willd.* iii. 371.

Annual, diffuse. *Leaves* opposite lanceolate. *Spikes* terminal, four-sided. *Flowers* opposite, with three orbicular bractes to each. *Corols* ringent. *Capsules* linear; *seeds* numerous.

Is very common on dry rice grounds, during the dry season.

Stem annual, weak, straggling, ramous, four-sided, jointed, smooth, of a purplish colour, about a foot long. *Branches* opposite, and like the stem. *Leaves* opposite, remote, sessile, lanceolate, entire, smooth, size various, often coloured. *Spikes* terminal, long, four-sided. *Flowers* opposite, decussated, blue, each embraced by the sessile, orbicular bractes. *Calyx* five-cleft. *Corol* ringent. *Anthers* two-cleft at the base. *Stigma* simple. *Capsule* linear, oblong. *Seeds* numerous, small, round, of a shining brown.

22. R. *triflora. R.*

Annual, creeping, hairy. *Leaves* cordate, serrate, or pinnatifid. *Flowers* verticelled. *Corols* ringent. *Seeds* numerous.

A native of ditches, low ground, &c. in Bengal; it appears during the cold season.

Stems creeping, with leaf and flower-bearing extremities, erect, hairy. *Leaves* opposite, the most inferior longer-petioled, ovate-cordate, serrate, hairy, from one to two inches

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long. *Flowers* axillary, three-fold, one a common short peduncle, pretty large and of a pleasing deep-rose, or purple colour. *Bractes* oblong, hairy, four or five to each fascicle of flowers. *Calyx* hairy, five-parted; *divisions* long, narrow and acute. *Corol* ringent; *upper lip* vaulted, two-parted; the *under* one expanding, broader, three-parted. *Anthers* bifid. *Stigma* two-parted, one division much longer and hooked. *Capsule linear*, as long as the calyx. *Seeds* numerous.

23. R. *suffruticosa. R.*

Suffruticose, erect, hairy. *Leaves* short-petioled, lanceolate, obtuse, ciliate. *Flowers* terminal, solitary, sessile. *Corol* with a long slender tube, and sub-regular border. *Capsules* oblong, few-seeded.

A small, erect, ramous under shrub, of about one foot in height, with large, terminal, white flowers, which appear during the rainy season; opening at sun-set, and dropping in the morning.

A native of the district of Dinagepore, &c.

LEPIDAGATHIS. Willd.

Calyx of two opposite, unequal pairs of leaflets, ringent; the *upper lip* small, the *under* one three-parted. *Anthers* twin. *Capsule* two-celled, two-valved, bursting with elasticity contrary to the partition.

L. *cristata. Willd.* iii. *p.* 400.

Perennial, diffuse. *Leaves* opposite, sessile, lanceolate. *Inflorescense*, a dense head close to the crown of the root.

The generic character is but little removed from *Barleria*, but the habit of the plant is very different. It is a native of elevated, dry, barren ground, all over the coast of Coromandel. Flowering time, the rainy and cold season.

Root perennial. *Stem* scarcely any, but several, long, slender, opposite, diffuse, four-sided, ramous, smooth branches, spreading close on the ground, and often striking root. *Leaves* opposite, sessile, lanceolate, entire, sometimes villous or even hairy, and scabrous; from one to three inches long and half an inch or less broad. *Inflorescense* in large, variously shaped, densely imbricated heads, close to the earth, near the root, with smaller ones scattered over the joints of the large branches. *Bractes* numerous, imbricated, lanceolate, ciliate, pointed. *Flowers* numerous, small, of a rose colour. *Calyx* of two pairs of unequal leaflets, the *exterior* pair much larger, with the lower leaflets bidentate, all are hairy and ciliate. *Corol* one-petalled, ringent; *tube* gibbous, with the mouth contracted. *Throat* campanulate; the *upper lip* erect, emarginate; the *under lip* large, three-parted; middle division broad, emarginate, a little curled, and more deeply coloured. *Filaments* within the throat of the corol. *Anthers* twin. *Germ* ovate, elevated on a glandular receptacle. *Style* sufficiently long to elevate the small stigma even with the anthers. *Capsule* ovate, acute, sessile, two-celled, two-lobed, bursting with elasticity, as in *Justicia, Barleria*, &c.

III. 54

ROSCOEA. R.

Gen. Char. *Involucre* few-flowered. *Calyx* tubular. *Corol* irregular. *Stamina* very long, and distinct. *Germ* four-celled; *cells* one-seeded; *attachment* superior. *Berry* one-seeded. *Embryo* erect, without perisperm.

1. R. *pentandra. R.*

Involucre six-leaved, six-flowered. *Flowers* pentandrous. *Stigma* bifid. *Leaves* opposite, from ovate-oblong to lanceolate, smooth.

Kungea, the Bengalee name.

A large, climbing, permanent shrub, a native of the forests near Silhet, where it flowers in February, March, and April, and the seed ripens during the rains.

Trunk ligneous, soon dividing into many long, scandent, woody branches, covered with rough ash-coloured bark. *Branchlets* opposite, the tender shoots villous; the ligneous ones scabrous, very small, and villous. *Stipules* nothing more than a villous ridge. *Panicle* axillary, and terminal, the terminal one large, and composed of several pairs of opposite, spreading, four-sided, villous branches. *Umbellets* opposite, solitary, long-peduncled. *Bractes* like the leaves, but much smaller and villous, one under each of the opposite peduncles, which support the umbellets. *Involucre* six-leaved, and about six-flowered; *leaflets* spreading, linear, obtuse, smooth, veined, much longer than the flowers. *Flowers* sessile, purple, inodorous. *Perianth* proper, campanulate, entire, ribbed, villous, permanent. *Corol* one-petalled; *tube* short; *throat* very woolly. *Border* of five or six spreading, sub-rotund, nearly equal divisions. *Filaments* five, or sometimes six, corresponding with the segments of the border of the corol, unequal, inserted within the mouth of the tube, much longer than the corol and variously bent. *Anthers* two-lobed, cordate. *Germ* superior, hairy, two-celled, the cells more than half divided by incomplete partitions which project from the centre of the complete one. *Ovula* four, one in each cell, attached from the apex to the top of the axis. *Style* the length of the stamina. *Stigma* bifid. *Berry* superior, globular, hairy; half hid in the calyx, of the size of a small pea, one-celled. *Seed* solitary, conform to the berry. *Integuments* two. The *exterior* one is the cortex of the berry; the *interior* one membranaceous. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, nearly equal, the line of separation serpentine. *Radicle* small, inferior.

III. 55

2. R. *villosa. R.*

Involucre three-leaved, from five to ten-flowered. *Stigma* bidentated. *Leaves* opposite, cordate, downy. *Anthers* two-lobed. *Stigma* slightly two-parted. *Berry* dry, top-shaped, four-

partible, each part one-seeded.

The leaves of these plants have a strong, heavy, disagreeable smell; they are used for fomentation by the natives. Page Carey Ed.

A stout extensive, scandent shrub; it is a native of Pegue in the vicinity of Rangoon. The Rev. F. Carey found it common in the hedges. The young shoots are round and densely clothed with light brown, soft, short pubescence. *Leaves* opposite, short-petioled, cordate, entire, somewhat pointed, with short hairs on the upper surface, and the under one downy, from two to eight inches long, and from one to five broad; those accompanying the ramifications of the inflorescence are very small, more pubescent and coloured, in fact they may be called bractes. *Stipules* a connecting ridge only, extending through the division of the inflorescense. *Panicles* axillary, large, downy, generally composed of a few opposite pairs of branches, bearing single, opposite, long-peduncled involucred umbellets of small white flowers *Bractes* no other than the floral leaves above-mentioned. *Involucre* three-leaved, from five to ten-flowered; *leaflets* spreading, sessile, oblong, veined, often emarginate or retuse, tomentose, much longer than the flowers; those on the inside of the base next to the flowers hairy like the calyx. *Perianth* proper, campanulate, five-toothed, both sides clothed with long soft white hair. *Corol* one-petalled; *tube* cylindric, longer than the calyx. *Border* of two unequal lips; *one*, viz. the interior one in all the exterior flowers in the same umbellet, is divided into three short, rounded segments; the *other*, or exterior one, as long as the tube, and deeply divided into two obovate segments. *Filaments* four, more than twice the length of the corol, variously contorted; the pair next the long lip shorter. *Anthers* two-lobed. *Germ* superior, oblong, two-celled, each cell half divided by two incomplete partitions, which project from the centre of the complete partition, containing four seeds attached to the upper end of the angle formed by the partitions. *Style* as long as the stamina. *Stigma* bidentate. III. 56

3. R. *tomentosa. R.*

Involucre three-leaved, from six to nine-flowered. *Stigma* entire. *Leaves* opposite, cordate.

An immense, climbing shrub, or I may say tree, a native of forests of Chittagong, where it blossoms in March.

Bark of the large trunk, and old ligneous branches, scabrous and ash-coloured, of the young shoots tomentose. *Leaves* opposite, short-petioled, cordate, entire, more or less villous, according to age, from four to six inches long, and from three to four broad. *Floral leaves* small, and very downy. *Panicles* axillary and terminal, composed of many ascending, opposite pairs of tomentose branches, giving support to the opposite, single, peduncled umbellets of small, white flowers. *Bractes* from oblong to cordate, very downy, solitary, sessile, one at the base of each peduncle. *Involucre* three-leaved, from six to nine-flowered; *leaflets* elliptic, downy, pink-coloured, some few of them emarginate, above an inch long, and above half an inch broad. *Perianth* tubular, very hairy, five-toothed. *Corol; tube* the length of the calyx; *border* bilabiate; the *exterior lip* very long, and bifid; the *under* or rather *interior* one of three oval, equal, sessile segments. *Filaments* didynamous, very long, much exceeding the exterior lip of the corol, variously bent. *Anthers* two-lobed. *Germ* sub-turbinate, &c. &c. exactly as in the former species. *Pericarpium* not seen. III. 57

A native of Coromandel, where it flowers in the cold season.

CLERODENDRUM. Schreb. gen. N. 1057.

Calyx five-cleft. *Corol* irregular, funnel-shaped. *Stamina* very long. *Germ* superior, seems four-celled. *Cells* one-seeded; *attachment* sub-interior. *Berry* or *capsule* dry, four-lobed, with a single seed in each. *Embryo* erect, without perisperm.

1. C. *phlomoides. Willd.* iii. 306.

Arboreous. *Leaves* ovate-cordate, scollop-dentate, downy. *Panicles* terminal; *berries* turbinate, dry.

Volkameria multiflora. *Burm. Ind.* 137. *t.* 45. *f.* 1.

Telaki of the Telingas.

Of this small tree, there are two varieties, one, the common one, with white flowers; the other with red, this variety is rare, a native of the mountainous parts of the coast of Coromandel, and differs from the white variety in the colour of the flowers only, consequently, the same description serves for both. III. 58

Trunk from six to ten feet high, and as thick as a man's thigh, near houses it is so much cut for firewood, &c. so that the size cannot be determined by such plants. *Bark* light ash-colour. *Leaves* opposite, petioled, broad-cordate, scollop-dentate, downy, one or two inches each way. *Petioles* round, downy, half the length of the leaves. *Flowers* numerous, from the extremities and exterior axills, forming a large leafy panicle; *peduncles* generally three-parted. *Bractes* oval, petioled.

2. C. *inerme. Gært. Sem.* i. *t.* 75.

Shrubby, scandent. *Leaves* oval, entire, smooth. *Peduncles* three-flowered. *Berries* dry, turbinal, four-partible.

Volkameria inermis. *Willd.* iii. 303.

Nir-notsjil. *Rheed. Mal.* v. *t.* 49.

Jasminum littoreum. *Rumph. Amb.* v. *t.* 46.

Beng. Bun-jumat.

A large, ramous, often scandent shrub, delighting in a salt, sandy soil, near the sea. Flowering time, the cold season chiefly.

Leaves opposite, or nearly so, sometimes three-fold, short-petioled, oval, smooth, entire,

Page Carey Ed. fleshy; both sides dotted with numerous minute, dark green dots; from one to two inches long. *Stipules* none. *Peduncles* axillary, solitary, generally three-flowered. *Calyx* small, five-toothed. *Corol*; *tube* widening a little near the apex; *border* of five, distinct, equi-distant, roundish segments. *Fruit* dry, pear-shaped, four-partible. *Seeds* solitary.

VOLKAMERIA. Schreb. gen. N. 1056.

Calyx five-cleft. *Corol* one-petalled, with unilateral segments, opposite to the long curved stamina. *Germ* superior, seems four-celled; *cells* one-seeded; *attachment* sub-interior. *Berry* (or *capsule*) four-lobed, four-partible, with a single seed in each. *Embryo* erect; without perisperm.

III. 59

1. V. *infortunata. Roxb.*

Shrubby. *Leaves* ovate-cordate, serrulate, downy. *Panicles* terminal, brachiate. *Berry* enclosed in the enlarged coloured calyx, four-lobed.

Clerodendrum foliatum, &c. *Burm. Zeyl.* 66. *t.* 29. *infortunatum. Willd.* iii. 386.

Peragu. *Rheed. Mal.* ii. *t.* 25.

Bhanti, or Bhantaca, in Sanscrit.

Hind. Bhant.

A very pretty shrub when in flower, and fruit. It is generally found under the shade of large trees, in consequence of birds dropping the seeds there. Flowers in February and March; seed ripens in April.

Stem erect, somewhat quadrangular. *Branches* few, opposite, four-sided. *Leaves* opposite, petioled, remote, cordate, slightly serrate, downy, very various in size, but in general large, in old plants much narrower, even ovate lanceolate. *Panicles* terminal, large, cross-armed, coloured. *Flowers* numerous, pretty large, white with a small tinge of red. *Calyx* increasing with the fruit, of a bright red: *divisions* lanceolate, waved. *corol*, its five divisions are ranged in a semicircular form on the upper side. *Stamens* nearly equal, ascending until fecundation is over, then declining. *Style* declined until fecundation is over, then ascending. *Berry* a little depressed, somewhat four-lobed, lodged in the calyx, the divisions of which are now enlarged, of a conic shape, red and leathery, of the size of a small black cherry; when ripe, of the same smooth, shining, black colour. *Seeds* four in the complete berries, but it is seldom they all come to perfection, convex and wrinkled on the outside. *Embryo* erect, without perisperm.

III. 60

2. V. *Buchanani. Roxb.*

Shrubby, erect. *Leaves* cordate, entire, downy. *Corymbs* terminal. *Calyx* shorter than the succulent berries, and reflected back from them.

A shrub, received from Dr. Buchanan at Luckipore where the plant is found wild. The same plant was afterwards received from the Moluccas. Flowering time the close of the rains; the seed ripens in January.

Stem erect, with few expanding, opposite branches. *Young shoots* downy, and somewhat four-sided. *Leaves* opposite, petioled, cordate, entire, downy on both sides, from four to six inches long, and from three to four broad. *Corymbs* terminal, bearing many, pretty large, deep scarlet coloured flowers. *Peduncles* and *pedicels* villous and coloured. *Bractes* small, coloured, and villous. *Calyx* five-cleft, small and pretty smooth. *Corol*; *tube* slender, five or six times longer than the calyx, (this mark alone distinguishes it from *Volkameria infortunata.*) *Border* of five, equal, erect, unilateral divisions. *Berry* four-lobed, four-seeded, sitting on the reflexed, bright red coloured, permanent calyx; when ripe of a dull bluish purple colour.

3. V. *Kæmpferi. Willd.* iii. 385. *Banks's icon. Kæmpf. t.* 50.

Shrubby. *Leaves* long-petioled, round-cordate, sub-entire, margins a little waved, scaly underneath. *Panicles* terminal, brachiate, broad-ovate, coloured. *Calyx* globular. *Berries* succulent.

A large, ramous, erect, shrub, now common in gardens about Calcutta; it was originally introduced from China. Is in flower during the hot and rainy season.

Root branchy. *Stem* scarcely any, but many erect branches, which are woody, and columnar below, young parts obtusely four-sided, and a little scabrous. *Leaves* opposite, petioled, round-cordate; *lobes* large and rounded; *margins* entire, a little downy, the under side is covered with small concave scales; from six to twelve inches each way. *Petioles* round, from four to eight inches long. *Stipules* no other than a hairy ring round the branchlet, at the insertion of the leaves. *Panicles* terminal, large, cross-armed, every part thereof of a deep, bright, beautiful scarlet colour, even the floral leaves of the lower ramifications. *Bractes* solitary, linear, recurved. *Flowers* numerous, middle-sized, scarlet coloured. *Calyx* at all times scarlet coloured. *Corol*, divisions of the border shorter than the tube, reflexed in a semi-circle over the upper side. *Stamens* ascending. *Stigma* bifid; *segments* acute.

III. 61

4. V. *dentata. R.*

Shrubby. *Leaves* round-cordate, acutely-dentate, acute; *lobes* rounded, and so large as to overlap each other. *Panicles* terminal, brachiate, coloured.

An erect, very elegant shrub, of three or four feet in height, a native of the Silhet district; flowering time the hot and rainy season; it has not yet ripened seed in the Botanic garden, where it grows luxuriantly, and is very ornamental when in flower. It differs from V. *Kæmpfera* and *Buchanani* in the leaves being dentate, and from *urticifolia* in being a permanent shrub; besides in that species the leaves are much deeper cut round the margin, and the lobes never so large as even to meet. In all the four, the flowers are nearly alike in size, structure and colour, viz. a very bright deep scarlet.

5. V. *urticifolia. Roxb.* Page Carey Ed.

Herbaceous. *Leaves* broad-cordate, acuminate, grossly and acutely dentate. *Panicles* terminal, coloured.

An elegant, middling-sized species, a native of Pegue, from thence introduced into the Botanic garden at Calcutta by the Rev. F. Carey, where it blossoms in August, September and October.

Stems herbaceous in our young plants, simple, erect, becoming somewhat ligneous towards the base, and thinly covered with rough ash-coloured bark; tender shoots with four obtuse angles and grooved sides, covered with villous green bark; whole height from three to four feet. *Leaves* opposite, the inferior one very long-petioled; the superior, or floral ones sub-sessile; all are broad-cordate, with the acuminate margins grossly and acutely serrate-dentate, and the *surfaces* rather rough, the superior one with short bristles, and the inferior with little peltate glandular scales; *length* and *breadth* from five to ten inches. *Stipules* none, but a belt of hairs between the insertion of the petioles. *Panicles* terminal, solitary, large, and broad; composed of expanding, opposite, several times dichotomous, highly coloured, (scarlet,) villous, many-flowered ramifications. *Bractes* small, subulate, coloured. *Calyx* sub-cylindric, small for a *volkameria*, five-parted. *Segments* lanceolate, villous. *Corol* one-petalled; *tube* twice the length of the calyx, sub-cylindric; *border* to five, sub-secund, linear-oblong, obtuse, concave segments; colour of the whole scarlet. *Filaments* nearly equal, twice the length of the corol, coloured, smooth, on the first day incurved, on the second recurved. *Anthers* brown, incumbent. *Germ* oval, somewhat four-lobed, seemingly four-celled, with one ovulum in each, but on a minute inspection there are found two, opposite, parietal receptacles, which meet so exactly in the centre, as to appear a complete partition, each of these divide into two, recurved, secund, rather incurved. *Stigma* of two subulate acute lobes. III. 62

6. V. *obovata. Roxb.*

Leaves obovate, entire, coriaceous, downy underneath. *Panicle* terminal, decussate, downy, the extreme ramifications, lengthened, secund spikes. *Calyx* obscurely five-toothed.

A native of the Moluccas.

7. V. *serrata. Willd.* iii. 384.

Shrubby. *Leaves* sub-sessile, opposite, and tern, lanceolate, serrate, smooth. *Panicle* terminal, oblong, decussate. III. 63

Found in Mysore by Dr. Buchanan, who sent the seeds to the Botanic garden at Calcutta, where the plants blossom during the rains.

Trunk erect, stout, ligneous. *Branches* erect, decussate, or tern; *young shoots* smooth, four-sided. *Leaves* opposite, or tern, sub-sessile, broad-lanceolate, serrate, smooth on both sides; from four to eight inches long, and from one to three broad. *Panicles* terminal, ramifications decussate, villous, two-forked. *Bractes* lanceolate, villous. *Flowers* numerous, large, two pairs of lateral segments, pale blue; the lower one deep blue. *Calyx* obscurely five-dentate. *Corol; tube* short, deeply divided on the upper side, incurved. *Border* of five, nearly equal, expanding divisions, placed on the under side. *Filaments* longer than the corol, erect, with their extremities beautifully recurved. *Anthers* oval. *Style* as long as the stamens. *Stigma* of one long (the under), and one shorter lobe. *Berry* with from one to four lobes, smooth, succulent, when ripe of a shining black. *Seeds* one in each lobe of the berry, obovate. *Corol, tube* the length of the calyx, villous. *Border* of five, unequal, segments, placed on the under side, the two lateral pairs oblong, of a very pale blue, the lower one much larger, cuneate-cordate, and of a much deeper colour. *Filaments* swelled and villous at the base, inserted on the mouth of the tube, and rising erect through the vacant space on its upper side, towards the apex beautifully recurvate. *Anthers* brown, two-lobed. *Germ* roundish, having its base surrounded by a yellow nectarial ring, four-celled, with one ovulum in each, attached to the upper and exterior margins of the partitions. *Style* the length of the stamina. *Stigma* two-parted. *Capsule* nearly round, of the size of a pea, somewhat four-lobed, hairy; when ripe dry, and then falling spontaneously into four equal portions. *Seed* solitary, obliquely oblong. *Integument* single. *Perisperm* none. *Embryo* erect. *Cotyledons* linear-oblong, thick, fleshy and white. *Radicle* oval, inferior.

8. V. *farinosa. R.* III. 64

Shrubby twigs mealy. *Leaves* opposite, petioled, oblong, serrate. *Panicles* terminal, linear-oblong, leafy. A very stout shrub, or small tree, a native of Silhet, where it is called *Taleuser*. Flowering time the rainy season. It approaches nearest to *serrata* of any species known to me, but differs sufficiently on account of the perfect smoothness of the latter, which has the leaves as often tern as opposite; in *farinosa* petioled, always opposite.

9. V. *nereifolia. R.*

Shrubby. *Leaves* tern, linear-lanceolar. *Peduncles* axillary, three-flowered.

A shrubby species, found indigenous on the Island of Mascal, on the coast of Chittagong; where it blossoms about the close of the rains, and the seeds ripen in February.

Stem short, but straight, stout and ligneous, soon dividing into many straight, nearly erect branches and branchlets; *bark* smooth, and of a light ash-colour and marked with light-coloured small elevated specks. *Leaves* tern, rarely opposite, linear-lanceolar, entire, acute, smooth, about three inches long, and very generally under half an inch in breadth. *Petioles* short, and inserted on permanent elevated leaves. *Peduncles* axillary, much shorter than the leaves, generally three-flowered. *Bractes* opposite, ensiform. *Calyx* campanulate, mouth evenly five-toothed, permanent. *Corol* with a rather short, slender, curved tube, and unilateral border, composed of five equal, oval, entire segments. *Stamina* twice the length of the corol, incurved or recurved, according to the length of time the flower has been expanded.

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Germ superior, four-celled, with one ovulum in each. *Style* length of the stamina. *Stigma* bidentate. *Capsule*, (*Berry*, Gært.) broad-turbinate, four-grooved, size of a nutmeg, when ripe dry, and spontaneously dividing first into two and afterwards into four parts. *Cortex* pretty smooth, dark brown. *Pulp* in large quantity, somewhat spongy. *Seed* in each division of the capsule, oblong, tapering towards the base. *Integuments* two, both soft, thin and white. *Perisperm* none. *Embryo*, erect. *Cotyledons* conform to the seed, equal. *Plumula* two-lobed. *Radicle* inferior, the whole much like *Clerodendrum inerme. Gært.* i. *t.* 57.

HASTINGIA. König's Mss.

Calyx coloured, much expanded, almost entire. *Corol* with a long, curved tube, and unequally divided border. *Germ* superior, seems four-celled; *cells* one-seeded; *attachment* sub-interior. *Capsule* four-lobed, four-partible; *lobes* one-seeded. *Embryo* erect, without perisperm.

1. H. *coccinea. Kön. Mss. Smith's Exotic Botany*, 100.

Leaves cordate, serrate. *Panicles* terminal.

Holmskioldia *sanguinea. Willd.* iii. 360.

This most elegant plant was brought originally from China, though a native of the interior parts of Bengal also. At the Botanic garden it grows to be a small tree if trained up with single stem, but if left alone, the branches spread far every way from the base of the stem close upon the earth, and strike root. The *bark* is ash-coloured and tolerably smooth. Flowering time the cold season, at which period scarcely any plant can exceed it in beauty. It grows readily from cuttings.

Branches very numerous, brachiate, while young somewhat four-sided, and a little downy. *Leaves* opposite, petioled, cordate, serrate, long, pointed, a little downy, from three to four inches long. *Petioles* one fourth the length of the leaves, downy. *Stipules* none. *Panicles* on compound racemes, terminal, brachiate. *Peduncles* and *pedicels* a little hairy. *Bractes*, the larger ones petioled, cordate, the smaller lanceolate. *Flowers* numerous, pretty large, of a most beautiful scarlet colour, slightly tinged with orange, inodorous. *Calyx* one-leaved, very large, gradually widening into a most ample bell, with a slightly five-lobed border, coloured like the corol, permanent. *Corol* one-petalled, irregular. *Tube* longer than the *calyx*, projecting with a slight curvature downward, compressed laterally, widening gradually to the mouth; on the inside a little downy. *Border* small, five-parted; the under division larger. *Stamens* from the middle of the tube, and projecting a little beyond it, declining a little, somewhat downy. *Anthers* oval. *Germ* superior, four-lobed; *lobes* one-celled; one-seeded, attached to the partition a little above its middle. *Style* declinate with the stamens, and of the same length. *Stigma* acute, slightly two-parted. *Capsule* four-lobed, four-partible, each lobe obliquely turbinate, clavate, rugose, of the size of a small lentil, one-celled, one-valved, of a thick, soft, spongy texture, and dark brownish black colour. *Seed* conform to the lobe of the capsule. *Integument* single, from every examination I can give it, pretty thick, white, soft, and tough. *Perisperm* none. *Embryo* erect, amygdaline. *Cotyledons* two, oval, thick. *Plumula* small, semilunar. *Radicle* oval, inferior.

III. 66

2. H. *scandens. R.*

Shrubby, scandent. *Leaves* cordate, serrate, acuminate. *Flowers* axillary.

Daudmaree, the vernacular name in Silhet, where it is found wild in the forests; it blossoms during the cool months of December, and January. I am not very clear whether it be anything more than H. *coccinea* in its wild state.

SIPHONANTHUS. Schreb. gen. N. 165.

Calyx five-parted. *Corol* one-petalled, with a very long slender tube. *Germ* superior, seems four-celled; *cells* one-seeded; *attachment* sub-interior. *Berry* four-lobed; *lobes* one-seeded. *Embryo* erect, without perisperm.

III. 67

1. S. *hastata. R.*

Leaves opposite, hastate, downy.

A large shrub or small tree, a native of Silhet, where it is called *Hattee-kana* (Elephant's ear,) from the shape of the leaves. Flowers in April and May, and the seed ripens in June and July.

Young shoots villous, somewhat four-cornered. *Leaves* opposite, petioled, hastate, lobate, downy, particularly underneath, about six inches long. *Petioles* nearly as long as the leaves, downy and channelled. *Stipules* none. *Panicles* terminal, corymbiform, decussate, villous. *Bractes* like the leaves, but small, and diminishing fast toward the top, or extreme divisions of the panicle. *Calyx* campanulate, five-cleft. *Segments* sub-lanceolate, permanent and remaining coloured. *Corol* with a long, slender, recurved tube. *Border* of five, nearly equal, spreading, oblong segments. *Filaments*; two pairs, inserted into the tube of the corol a little within its mouth, long, coloured, smooth, various in their direction according to the length of time the flower has been open. *Anthers* incumbent. *Germ* ovate, four-cornered, seemingly four-celled, with one ovulum in each lobe, attached to the concave side of the wings of the parietal fungiform, receptacle, meeting in the centre, but not uniting, hence seemingly four-celled. *Style* the length of the corol. *Stigma* bifid; *lobes* acute, spreading. *Berries* shorter than the calyx, four-lobed, one, two or three of the lobes abortive, the fertile ones obovate, smooth, glossy, deep purple, and succulent, one-celled. *Seed* solitary. *Perisperm* none. *Cotyledons* obovate, fleshy. *Radicle* roundish, inferior.

2. S. *indica. Lamarck. Encycl. t.* 79. *f.* 1. 1606. Page Carey Ed.
Shrubby, straight. *Leaves* verticelled, lanceolate. *Panicles* terminal.
Brahmænee, Brahmunuyushtika, &c. Sanscrit names.
Beng. Brahman-patta, or Bamun hattee.
Siphonanthus *indica. Linn.* III.
Ovieda *mitis. sp. pl. ed. Willd.* iii. 382. 68

Found wild from Orissa northward; where it grows to be a tall, straight shrub. Flowering time the hot season, and again in October; the seed ripens in the cool season.

Stem erect, straight, simple, or with very few, straight branches, more or less piped, according to the age of the plant; *bark* smooth, greenish; *young shoots* smooth, of a shining green, with a double groove or furrow to each leaf of the verticel, and piped in the old woody parts; height various. In some parts of Bengal they are so long as to serve for rafters to cottages, and various other uses. *Leaves* verticelled, generally from three to five-fold, short-petioled, horizontal, lanceolate, entire, waved, above smooth, of a deep, shining green, below paler, from six to nine inches long. *Floral leaves* alternate and smooth. *Stipules* none, but in their place some short hairs. *Fascicles* from the axills of the exterior, alternate leaves, peduncled, in general solitary, erect, generally three-cleft; the whole forming a large elegant panicle. *Peduncles* and *pedicels* roundish, smooth, coloured. *Bractes* lanceolate, size various. *Flowers*, when they first open, white, gradually changing to cream colour. *Calyx* beneath, campanulate. *Corol; tube* exceedingly long, slender, bowing. *Border* five-parted; *divisions* oblong, nearly equal, reflected; the lower two more distant. *Filaments* four, inserted within the mouth of the tube, projecting in a double curve for some time after the flower first expands, afterwards they become revolute. *Anthers* incumbent, &c. according to the position of the filaments, base two-parted. *Germ* and contents as in S. *hastata*, four-lobed. *Style* longer than the stamens, at first projecting, or recurved, after impregnation ascending, when the stamens become revolute. *Stigma* acute, two-parted. *Berries* from one to four, conjoined, sitting on the enlarged, coloured calyx, singly the size of a pea, when ripe, of a dark bluish colour. *Seeds* one in each lobe of the berry; it seldom happens that all the four berries come to perfection. *Embryo* as in S. *hastata.*

VITEX. Schreb gen. N. 1060. III. 69

Calyx campanulate, five-toothed. *Corol* ringent. *Anthers* twin. *Germ* superior, generally two-celled; *cells* two-seeded; *attachment* central. *Drupe* with a four-celled nut. *Embryo* erect, without perisperm.

1. V. *trifolia. Willd.* iii. 392.

Sub-arboreous. *Leaves* ternate; *leaflets* all sessile, obovate, oblong, hoary underneath. *Panicles* terminal, with brachiate, dichotomous ramifications.

Cara-nosi. Rheed. Mal. ii. *t.* 10.

Lagondium vulgare. *Rumph. Amb.* ii. *t.* 10.

A small tree, or large shrub, a native of various parts of India, and its Islands. The leaves of this plant are a powerful discutient, and by the Malays employed to remove the *boss.* The following is their recipe, furnished, by W. Ewer Esq. The leaves are given in decoction, and infusion, and formed into a cataplasm, which is applied to the enlarged spleen. In very obstinate cases it becomes necessary to have recourse to gentle mercurials.

Young shoots round and villous. *Leaves* opposite, ternate. *Leaflets* all sessile, ovate, oblong, entire, hoary underneath; the pair from one to two inches long, and the terminal one much longer. *Petioles* about an inch long, and hoary. *Stipules* none. *Panicles* terminal, linear-oblong, composed of brachiate and dichotomous ramifications, every part hoary. *Flowers* small, of a lively light blue purple. *Bractes* minute. *Calyx* campanulate, hoary; *mouth* slightly five-toothed. *Corol* with the *lower lip* longer and undivided; the *upper lip* four-lobed. *Stamina* as long as the corol. *Anthers* twin. *Germ* round, two-celled, with ovula in each attached to the two angles of the septal receptacle. *Style* as long as the corol. *Stigma* of two filiform spreading lobes. *Drupe* round, smooth, when ripe black, size of a small pea, one-celled. *Nut* III. conform to the drupe, four-celled, nearly all fertile. *Seed* solitary. *Perisperm* when the seeds 70 are quite ripe none. *Embryo* erect. *Cotyledons* obovate-oblong. *Radicle* oval, inferior.

2. V. *Negunda. Willd.* iii. 393.

Arboreous. *Leaves* ternate, and quinate. *Leaflets* entire, lanceolate; the lower two sessile. *Panicles* terminal, long-pyramidal, with cross-armed, two-forked ramifications.

Bem-nosi. *Rheed. Mal.* ii. *t.* 12.

Lagondium litoreum. *Rumph. Amb.* iv. t. 19.

Sindooka in Sanscrit. See *Asiat. Res. vol.* iv. *p.* 292.

Also Sindoowara, Indrasoorusa, Nirgoondi, Indranika.

Beng. and *Hind.* Nisinda.

An elegant, small tree, though generally found in the state of a large shrub; delights in a rich, moist soil, yet it grows almost every where. Flowers all the year round.

Trunk irregular, often as thick as a man's thigh or more. *Branches* rather thin, opposite; *young shoots* downy, slightly four-sided. *Leaves* opposite, petioled, ternate and quinate. *Leaflets*, the exterior one or three, petioled; the lower two sessile; all are lanceolate, entire, soft; below of a very pale whitish green; from two to four inches long, and less than one broad. *Panicles* terminal, oblong, tapering to a point, erect; *rachis* straight, four-sided; ramifications decussated, generally three-forked; or two-forked with sessile flowers in the cleft. *Flowers* small, numerous, a most beautiful bluish purple. *Calyx* permanent, closely embrace

Page Carey Ed. III. 71

the bottom of the berry. *Corol; lower lip* large, entire; *upper lip* shorter, four-parted.

A decoction of the aromatic leaves helps to form the warm bath for women after delivery; bruised, they are applied to the temples for the head-ache; pillows stuffed with them are put under the head to remove a catarrh, and the head-ache attending it.

3. V. *paniculata. Lamarck Encycl.* ii. 606.

Arboreous. *Leaves* digitate, quinate; *leaflets* ovate-lanceolate, entire; the exterior one petiolate, the two inferior ones small, and sessile; smooth above, hoary underneath. *Panicles* terminal.

A native of the Moluccas. I doubt whether it be any thing more than a broad-leaved luxuriant variety of *Negunda. Rumphius, 19th plate of the 4th vol. of his Herbarium Amboinense*, is a bad representation of this plant, though no doubt intended for it.

4. V. *altissima. Linn. Suppl.* 294.

Arboreous. *Leaves* ternate; *leaflets* lanceolate, entire, acuminate. *Panicles* terminal, composed of opposite, verticelled, simple ramifications.

This, the most stately tree of the genus which I have yet met with, is a native of the mountainous forests of Coromandel. In Dr. Anderson's garden near Madras, it flowers in July and August. The same has since been found in the eastern parts of Bengal, where it flowers in June.

Trunk erect, of very considerable magnitude, and covered with smooth greenish gray bark. *Branches* numerous, spreading. *Leaves* opposite, ternate. *Leaflets* sessile, entire, acute, somewhat downy, with the upper surface of a deep green, and the lower one pale, from three to six inches long, and from one to two broad. *Petioles* common, somewhat channelled, and though long, they are shorter than the leaflets. *Panicles* terminal, composed of a few long, simple, opposite, pairs of sub-verticelled, downy spikes. At a more advanced age, what appeared verticels while young, become two opposite, short, bifid, or trifid secund spikes. *Flowers* numerous, small, collected, into short-peduncled, opposite fascicles, which appear like verticels. *Bractes* lanceolate, concave, downy. *Calyx* downy, the segments rather unequal. *Corol,* III. &c. as in the family. *Germ* ovate, four-celled, with one ovulum in each, attached to the parti- 72 tion. *Style* fully as long as the corol. *Stigma* bifid. *Drupe* round, of the size of a pea, smooth, succulent, black. *Nut* round, hard, four-celled. *Seeds* solitary. *Perisperm* none. *Embryo* erect.

5. V. *alata. R.*

Arboreous. *Leaves* ternate; *leaflets* lanceolate. *Petioles* winged. *Panicles* axillary.

Mail eloa. *Rheed. Mal.* v. *t.* 1.

A native of Chittagong, where it grows to be a large tree. From thence it was introduced by Dr. Buchanan into the Botanic garden at Calcutta, where it blossoms in the month of April.

Trunk straight, decorated with numerous, spreading and ascending branches, whole height of trees ten years old, about thirty feet. *Bark* smooth, of a dark, brownish, ash-colour. *Leaves* opposite, ternate. *Leaflets* lanceolate, smooth, entire, about six inches long. *Petioles* winged, particularly while the trees are young, about three or four inches long. *Panicles* axillary, solitary, erect, brachiate, with ramifications dichotomous, and a sessile flower in each division. *Flowers* numerous, pale yellow, tinged with very little blue. *Calyx* campanulate. *Border* unequally five-toothed. *Corol,* the middle lobe of the *upper lip* large, in proportion to its lateral lobes; the *under lip* two-parted, and small. *Anthers* twin. and of a bluish colour. *Berry* round, smooth, pulpy, when ripe purple, and the size of a marrow-fat pea. *Nut* turbinate, furrowed, four-celled, with a single seed in each.

6. V. *incisa. Willd.* iii. 392.

Shrubby. *Leaves* ternate and quinate; *leaflets* broad-lanceolate, gashed, of a soft fine texture, all are more or less petioled. *Panicles* terminal.

V. *Negundo. Curt. Mag.* 364.

III. *V. Chinensis of the Banksian Herbarium*, seems to be the same.
73 A native of China, from thence Mr. William Kerr sent seed to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and blossom when under one year old, and when less than a foot high. In six years they seem to have attained their full size, and are therefore large, ramous shrubs, of from six to eight feet in height.

Stem short, ligneous. *Branches* numerous, forming a large, ever-green bush. *Leaves* opposite, long-petioled, ternate, and quinate. *Leaflets* oblong, gashed, acute, smooth on both sides. *Panicles* terminal, from two to five inches long. *Flowers* numerous, small, white. *Lower segment* of the border of the corol much larger than either of the other four. *Drupe* the size of a grain of black pepper, with a four-celled nut.

8. V. *arborea. R.*

Leaves from ternate to quinate; *leaflets* sessile, oval. *Panicles* contracted.

Teling. Boosi.

A native of the mountainous parts of the Circars, Chittagong, &c. where it grows to be a very large tree. Flowering time, the hot season; the seeds ripen during the rains.

Trunk straight, high, and of a large size. *Bark* ash-coloured, cracked. *Heads* spreading and shady, but small in proportion to the size of the trunk. *Leaves* opposite, petioled, ternate, and digitate-quinate. *Leaflets* sessile, from broad-lanceolate to oval, sometimes obtuse, sometimes pointed, entire, veins many, running parallel, above pretty smooth, below downy; when there are five, exterior one from one to three inches broad, and from three to six inches long, the lower pair considerably smaller. *Petioles* the length of the inferior leaflets, channelled, downy. *Panicles* terminal, contracted, branchy; *branches* opposite, decussated. *Peduncles* and *pedicels* four-sided, villous. *Flowers* numerous, small, blue. *Bractes* oval, reflexed, downy, one

below each ramification. *Calyx* campanulate, five-toothed, permanent. *Corol*; *tube* somewhat gibbous, rather longer than the calyx, inside hairy at the bottom; throat compressed laterally; *border* two-lipped; the *upper lip* erect, two-cleft; the *under lip* reflexed, three-cleft, having the middle division largest, concave, and of a deep blue colour. *Filaments* twice the length of the tube, subulate. *Anthers*, split from the bottom up. *Style*, length of the filaments. *Drupe*, of the size and appearance of a black currant, smooth, succulent. *Nut* turbinate, very hard, four-celled. *Seed* solitary, obovate-oblong. *Integuments* two, both thin, soft, and rather succulent. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed. *Radicle* oval, inferior. 74

The wood of this tree when old is of a chocolate colour, exceedingly hard and durable, which renders it useful for various purposes.

9. V. *Leucoxylon. Willd.* iii. 392.

Leaves digitate, quinate; *leaflets* petiolate, oblong, very generally entire, both sides smooth. *Panicles* axillary, dichotomous.

Kariil. *Rheed. Mal.* iv. *t.* 36.

A native of Ceylon, Coromandel, and the mountains of Chittagong, &c. Flowering time the month of April.

Trunk laterally straight, and in its native mountains growing to be a tree of very considerable size. *Bark* soft, spongy and cracked on the outside. *Branches* rather scarce and spreading. *Young shoots* round and smooth. *Leaves* opposite, long-petioled, digitate, quinate, rarely ternate; *leaflets* petioled, oblong, generally entire, rather obtuse-pointed, smooth and polished, from two to six inches long, and from one to three broad. *Petioles* nearly as long the leaflets, round and smooth. *Stipules* none. *Panicles* axillary, solitary, long-peduncled, throughout dichotomous, with a sessile flower in the forks, drooping, ramifications tending to be angular, and most slightly villous. *Flowers* numerous, fragrant, pretty large, of a whitish straw colour, with the centre of the lower lip densely clothed with violet coloured hairs. *Bractes* very minute, and caducous. *Calyx* five-toothed. *Corol* with an unequal, five-cleft border; lower division large, round and curled. *Filaments* purple, protruded in a recurved manner. *Anthers* purple, two-lobed. *Drupe* oval, smooth, of a shining black. *Pulp* very soft, and in large quantity, of a dirty black colour. *Nut* oblong, compressed, somewhat furrowed, four-celled, it is rare however that all are fertile. *Seed* lanceolate, the upper end obtuse. *Integuments* single, white, and spongy. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, long obovate, of a tender, oily texture, pale white. *Panicle* conic, inferior. III. 75

10. V. *heterophylla. R.*

Leaves long-petioled, ternate and quinate; *leaflets* all long-petioled, broad-lanceolate, entire, acuminate, smooth.

A tall, slow-growing timber tree, a native of the Tippera forests; it has been fourteen years in the Botanic garden at Calcutta, and is thirty feet high without having blossomed.

11. V. *Saligna. R.*

Leaves ternate and quinate; *leaflets* petioled, lanceolar, entire, smooth. *Panicles* axillary, dichotomous.

A tree of considerable size; a native of the forests in the interior parts of Coromandel, from thence introduced by Dr. B. Heyne into the Botanic garden where it blossoms in April and May.

PREMNA. Schreb. gen. N. 1025.

Calyx from three to five-toothed. *Corol* irregular, four or five-cleft, woolly. *Anthers* twin. *Germ* superior, four-celled; *cell* one-seeded; *attachment* interior. *Stigma* two-cleft. *Drupe* with a four-celled nut. *Seed* solitary. *Embryo* erect, without perisperm. III. 76

1. P. *latifolia. Roxb.*

Arboreous. *Leaves* round-cordate, entire, smooth. *Corymbs* axillary, and terminal. *Throat* of the corol woolly.

Teling. Pedda-nella-Kura.

It is a native of most parts of the coast of Coromandel, though by no means common; grows to be a small tree. Flowers during the hot season.

Trunk erect. *Bark* ash-coloured, pretty smooth. *Branches* numerous, spreading. *Leaves* opposite, petioled, cordate or oval, entire, pointed or obtuse, a little downy, in general two and a half inches each way. *Petioles* round, generally about an inch long. *Corymbs* compound, terminal, or from the exterior axills, divided by threes. *Bractes* minute, falling. *Flowers* numerous, small, of a dirty yellow. *Calyx* campanulate, five-toothed, permanent. *Corol*, throat woolly; the *upper lip* three-cleft; the *under* one emarginate. *Anthers* bluish. *Style* longer than the corol. *Drupe*, the size of a pea, twin, juicy, smooth, when ripe black. *Nut* wrinkled, four-celled, all the four seeds seldom ripen.

The wood of this tree is white, firm, and used for various economical purposes. The leaves have a pretty strong, though not disagreeable smell, and are much used in curries by the natives.

2. P. *tomentosa. Willd.* iii. *p.* 314.

Arboreous. *Leaves* ovate-cordate, pointed, entire, very downy. *Panicles* terminal, corymbiform.

Teling. Naooroo.

A tree, a native of the mountainous parts of the Circars. Flowers during the cold season.

Bark, the exterior membranous, cracking and peeling off like that of the birch tree, of a light gray colour; *young shoots* covered with a soft gray down. *Leaves* opposite, petioled, cordate, pointed, entire, very downy underneath, and whitish, above light green, from four to five inches long, and about two and a half, or three broad. *Petioles* round, about an inch and III 77

Page Carey Ed. a half long. *Panicles* middle-sized, terminal, erect, downy, somewhat corymbiform, their ramifications scattered. *Bractes* filiform, downy. *Flowers* numerous, small, of a dirty greenish yellow. *Calyx* and *corol* as in the last species. *Anthers* yellow, twin. *Pistillum, drupe,* and *nut* as in the other species, in this seldom more than one of the seeds ripen, which make the most appear to have only one cell.

3. P. *serratifolia. Willd.* iii. 314.

Shrubby. *Leaves* cordate, serrate, acuminate, smooth, lucid, deep green. *Corymbs* terminal.

Beng. Bhoot-bhiruvi.

A large shrub, or small ramous tree, common in the woods in Bengal, is in blossom during the rainy months of July and August. The whole plant has a heavy unpleasant smell, nearly the same as in some of the other species of this genus.

Trunk short. *Branches* numerous. *Bark* smooth, and dark brown; *young shoots* somewhat villous. *Leaves* opposite, petioled, cordate, serrate on the anterior margins, long, acute, pointed, smooth on both sides, generally from one to six inches long, and from one to three broad. *Stipules* no other than a small connecting ridge. *Corymbs* terminal, or between two tender, terminal branchlets; primary divisions opposite, the last two-forked. *Flowers* minute, very numerous, of a pale greenish white. *Bractes* of the larger ramifications, lanceolate. *Perianth* small, irregularly three-toothed. *Corol* obliquely funnel-shaped. *Border* bilabiate, the superior lip narrow, undivided, and nearly double the length of the other, which is broad and three-parted. *Anthers* twin.

4. P. *spinosa Roxb.*

Arboreous, armed. *Leaves* opposite, three or four-fold, oval, entire, smooth on both sides. *Corymbs* terminal.

Gumira litorea. Rumph. Amb. iii. *t.* 134.

III. 78 *Hind.* Ustabunda.

Beng. Goniari.

Cornutioides. *Hor. Zeyl. N.* 416.

A small ramous tree, found in woods near Calcutta. Flowering-time, the beginning of the rainy season. The fruit ripens in three months afterwards.

Thorns are found on the trunk and larger branches only, large and strong, placed opposite and spreading. *Leaves* generally opposite, though sometimes three, or even four-fold, petioled, oval, entire, obtuse, smooth on both sides; from two to three inches long. *Petiole* short, smooth, slightly channelled. *Stipules* none. *Corymbs* terminal, peduncled, first ramification cross-armed, the rest two-forked, in branchlets with the leaves three-fold, the first ramifications of the corymbs are also three-fold, &c. *Bractes,* a small one below each ramification. *Flowers* very numerous, small, of a greenish yellow, very hairy, and of an offensive smell. *Calyx* three-cleft. *Corol, tube* thrice as long as the calyx; throat woolly; *upper divisions* of the border twice as long as the upper divisions of the border of the corol. *Calyx* the length of the stamens. *Drupe* globular, black, smooth, the size of a small pea. *Nut* turbinate, rough, four-celled.

5. P. *cordifolia. Roxb.*

Shrubby. *Leaves* cordate and cordate-ovate, entire, smooth, with the upper surface bullate and shining. *Corymbs* terminal, decussate, with ramifications dichotomous.

Folium hircinum. *Rumph. Amb.* iii. *t.* 133. agrees rather better with this species, than with any other I have yet found in India.

A native of Prince of Wales' Island, and from thence introduced into the Botanic garden at Calcutta in 1798, where it thrives and blossoms during the hot months of May and June.

Trunk erect; *branches* few, some straight, and free of branchlets as a rattan; other III. 79 ramulose, and straggling; the height of the plants in this garden, in four years, is from six to eight feet. *Bark* of the old woody parts dark brown, of the younger light-brown. *Leaves* opposite, short-petioled, from cordate to cordate-ovate, entire, pointed, bullate, at the same time the upper surface is of a bright, shining, deep green colour, from three to six inches long, and broad in proportion. *Stipules,* no other than a small connecting ridge. *Corymbs* terminal; primary ramifications decussate, then dichotomous; round, villous, and of a very dark brownish olive colour. *Bractes* oblong. *Flowers* very numerous, small, of a pale greenish white. *Calyx* bilabiate. *Corol* bilabiate. *Throat* filled with long, soft, white hairs. *Lips* equal in length; the *upper* one narrow, and entire; the *lower* one, broad and three-lobed. *Stamens* nearly as long as the corol. *Style* considerably longer than the corol. *Drupe* the size of a large pea. *Nut* three or four-celled.

The leaves of this species possess a small degree of fragrance, when bruised, at least to me the smell is not so disagreeable as that of the other species.

6. P. *longifolia. Roxb.*

Arboreous. *Leaves* ovate-oblong, acuminate, entire, smooth. *Corymbs* terminal.

A native of Bengal, where it blossoms during the rainy season.

Trunk erect; *branches* opposite. *Bark* smooth and ash-coloured, dark brown, or greenish brown according to age; general height of the tree twenty feet. *Leaves* opposite, petioled, from ovate-oblong to oblong, entire, acuminate, smooth on both sides, from four to ten inches long. *Petioles* channelled, somewhat villous, from two to three inches long. *Stipules* none except a small, connecting, villous ridge. *Corymbs* terminal, large, and spreading much; the first two or three pairs of divisions brachiate; afterwards dichotomous. *Bractes* minute. III. 80 *Flowers* numerous, small, white; *upper lip* larger, and two-toothed; the *lower lip* three-toothed. *Calyx* bilabiate. *Corol*; *tube* short; *border* four-parted; *upper division* longer, more

coloured and reflexed; the *lateral two* expanding, the *lower* broadest and emarginate. *Drupe* globular, of the size of a grain of black pepper, when ripe, smooth, shining black. *Nut* obovate, rugose, four-celled, with one seed in each. This is the only species I have yet met with, which I can say has anything like an agreeable smell, this mark alone is sufficient to distinguish it from the other species already described and figured by me; there are, however, as may be observed in the description, many other differences to rest its specific character on. Page Carey Ed.

7. P. *herbacea. R.*

Herbaceous. *Leaves* opposite, obovate, serrate. *Corymbs* terminal and axillary.

Beng. Bhooi-Jamb.

Bhoomi-Jambooka, its Sanscrit name.

A native of the interior parts of Bengal. From Dinagepore, Dr. William Carey sent the plant to the Botanic garden, where it blossoms during the months of February and March.

Root ligneous, perennial. *Stems* scarcely any, a few leafy, fructiferous, annual shoots rise from the roots about the close of the cold season, and when the seeds ripen decay. *Leaves* opposite, short-petioled, obovate, serrate, a little villous on both sides, very various in size. *Corymbs* terminal, and axillary, small, and shorter by far than the leaves. *Flowers* small, of a pale whitish yellow. *Corol* four-cleft; *upper segment* round; *throat* hairy.

8. P. *mucronata. R.*

Arboreous. *Leaves* broad-ovate, tapering at the base, sharply acuminate, entire, slightly villous. *Corymbs* terminal.

A small tree, a native of Silhet, and there called Manoamal. Flowering in April, and the seed ripens in July and August. The wood is said to be remarkably hard and useful. It differs from all the other species known to me, in the tapering base of the leaves; the sharp point of the acuminate leaves is also a good mark; for though in P. *scandens* the same mark exists, even in a greater degree, yet this is a small tree; that a scandent shrub. III. 81

9. P. *esculenta. R.*

Shrubby. *Leaves* short-petioled, oblong, grossly serrate, acuminate, smooth. *Corymbs* terminal, dense.

A native of Chittagong, where the natives use the leaves in their diet, as well as in medicine. In the Botanic garden it continues in flower and fruit nearly the whole year.

Stem short. *Branches* and *branchlets* opposite. *Bark* on the young shoots, smooth, of a clear green. *Leaves* opposite, short-petioled, oblong, broadest a little above the middle, grossly and acutely serrate, acuminate, from four to ten inches long, by from two to five broad. *Stipules* none. *Corymbs* terminal, short-peduncled, broad, and much crowded, with some pairs of opposite, multifid, smooth branches. *Flowers* numerous, small, of a greenish yellow. *Bractes* minute. *Calyx* unequally five-toothed. *Corol* with a short campanulate tube. *Border* four-parted; *upper lobe* broad, obtusely three-toothed, and vaulted over the hairy mouth of the tube, anthers, and stigma; the other three lobes nearly equal, and may be called the lower lip; the base of the middle one thereof is yellow. *Anthers* twin. *Germ* four-celled, with one ovulum in each, attached to the upper part of the partitions. *Style*, length of the stamina. *Stigma* two-toothed. *Drupe* minute, round, smooth, purple. *Nut* turbinate, rugose, four-celled, with a perforation up the centre. *Seeds* solitary, obovate. *Perisperm* none. *Embryo* erect. *Cotyledons* equal, conform to the seed. *Radicle* inferior.

10. P. *integrifolia. Willd.* iii. 314.

Arboreous. *Leaves* elliptic, entire, smooth. *Corymbs* terminal, rather irregular.

Folium hirci. *Rumph. Amb.* iii. *t.* 134.

Cornutia *corymbosa. Burm. Ind.* 133. *t.* 41. *f.* 1. III. 82

Found by Colonel Hardwicke indigenous on the Mauritius, in flower in May and June.

11. P. *scandens. R.*

Shrubby, scandent. *Leaves* from ovate-oblong to cordate, entire, much and very finely acuminate. *Corymbs* terminal, supra-decompound. *Calyx* entire; *throat* of the corol woolly. *Nut* tubercled.

An extensive, powerful, climbing shrub, a native of the forests of Silhet, where it runs over the larger trees. Flowering time the hot season; the seed ripens during the rains.

Young shoots more or less villous and somewhat four-cornered. *Leaves* opposite, differing in shape from narrow ovate-oblong to cordate, all perfectly entire, ending in a long sharp, ensiform, or even filiform point, sometimes villous, from four to six inches long, and from one and a half to four broad. *Petioles* about an inch long, generally villous. *Corymbs* terminal; primary divisions decussated, secondary one dichotomous; all villous. *Bractes* subulate. *Flowers* numerous, very small, of a greenish yellow. *Calyx* cup-shaped, entire, smooth. *Corol* with the mouth of the tube very woolly. *Border* of four, equal, oblong, obtuse divisions. *Stamina* longer than the corol. *Germ* roundish, four-celled, with one ovulum in each, attached to the axis. *Style*, the length of the stamina. *Stigma* bifid. *Drupe*, the size of a pea, round, smooth, succulent, black, one-celled. *Nut* conform to the drupe, tubercled, four-celled, generally one or more abortive. *Seed* solitary, obovate. *Integument* single, thin, white. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed. *Radicle* inferior.

GMELINA. Schreb. gen. N. 1023.

Calyx from four to five-toothed. *Corol* obliquely campanulate; *border* irregularly four-parted. All the anthers two-cleft. *Germ* superior, four-celled; *cells* one seeded; *attachment* sub-superior. *Drupe* with a nut, from one to four-celled. *Embryo* erect, without perisperm. III. 83

1. G. *oblongifolia. R.*

Page Carey Ed. Arboreous. *Leaves* opposite, oblong. *Panicles* terminal, brachiate. *Drupes* oblong, luci A slow growing, tall timber tree; a native of the eastern parts of Bengal; flowering in Mar and April; the seed ripens in August and September.

Trunk, in trees fourteen years old in the Botanic garden, straight, from twelve to fifte feet to the branches, and about eighteen inches in circumference. *Bark* ash-coloured, and little cracked. *Branches* ascending. *Young shoots* somewhat four-sided, total height of o young trees from twenty to thirty feet. *Leaves* opposite, petioled, from oval to oblong, entir somewhat rough, rather obtuse, with a glandular impression on each side of the base of th rib or nerve, from six to twelve inches long, and from three to eight broad. *Petioles* about tw inches long, channelled. *Stipules* none. *Panicles* terminal, solitary, broad-ovate, decussate ramifications four-cornered, clothed with a brownish mealiness. *Bractes* small, and very earl caducous. *Flowers* numerous, large, rosy and fragrant. *Calyx* cyathiform, entire, mealy, a fe glands on the outside. *Corol* irregular. *Tube* short and curved. *Throat* obliquely campanulat *Border* five-parted; *lower segment* longer, with a deep yellow mark in the centre of its bas *Stamina* as in the genus. *Anthers* bipartite. *Germ* superior, turbinate, smooth, four-celle with one ovulum in each, attached from a little under the apex, to the upper part of the axis *Style* the length of the stamina. *Stigma* of two unequal lobes. *Drupe* oblong, somewhat fou cornered, and obtuse, size of a large olive, smooth, when ripe of a shining bright crimso III. colour, one-celled. *Nut* clavate, four-cornered, four-celled, perforated from the base up th 84 centre. *Seed* solitary, lanceolate. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to th seed. *Radicle* small, inferior.

2. G. *arborea. Roxb. Corom. pl.*

Arboreous, unarmed. *Leaves* opposite, cordate, entire, hoary underneath. *Panicles* ter minal.

Cumbulu. *Rheed. Mal.* i. *t.* 41.

Gumbharee, the Sanscrit name of the tree.

Beng. Gumar, Goombar.

Hind. Joogani-chookur.

Teling. Tagoomooda.

Tam. Goomadee.

A large timber tree, a native of the mountainous parts of India. Flowering time the be ginning of the hot season.

Trunk straight. *Bark* ash-coloured, in young trees, smooth. *Branches* numerous, spread ing in every direction, so as to form a large shady head. *Leaves* opposite, petioled, cordate pointed, entire, with the upper surface smooth, and the under one hoary, from four to ten inche long, and from two to six or seven broad; at the base where it joins the petiole, there are two three, or four very conspicuous glands. *Petioles* round, villous, two or three inches long. *Pani cles* terminal, ovate, composed of expanding decussated, downy racemes. *Bractes* lanceolate downy, deciduous at an early period. *Flowers* opposite, drooping, large, yellow, tinged with brown. *Calyx* small, obscurely five-toothed, villous on the outside. *Corol* campanulate. *Bor der* four-parted, the upper three segments shorter; the lower or middle one bifid. *Filament* two pairs; the longest considerably incurved. *Anthers* bifid. *Germ* round, four-celled, with one ovulum in each, attached to the top of the axis. *Style* as long as the stamen. *Stigma* bifid, one of the lobes much longer and recurved. *Drupe* oval, smooth, when ripe yellow, o III. the size of a damson. *Nut* four-celled, though it rarely happens that the four are fertile. 85 The wood of this tree is used for a variety of economical purposes by the natives of va rious countries where it grows. That of such trees as will square into logs from eighteen t twenty-four inches resembles Teak more than any other sorts I have yet met with. The colou is almost exactly the same, the grain rather closer, at the same time it is fully as light, if no lighter, and as easily worked.

Some years ago I received from Mr. M'Cleish, a Timber Merchant, then residing at Pat na, but since dead, a large square log, of what I conceive to be this wood, which measured nearly thirty feet in length, and at the thickest end was full twenty-four inches square.

This piece afforded ample supplies for various experiments. One of them, and the most interesting, was made by placing part of an outside plank in the river, a little above low water mark, exactly where the worm is thought to exert its greatest powers. After remaining three years in this situation, though examined from time to time, the piece was cut, with the view of carrying a specimen of it to England, and to my great joy, I found it as sound and every way as perfect throughout, as it was when first put into the river.

Amongst other things, a valuable flood door was made of it, to keep the tides out of the Botanic garden. It is now seven years and a half since the door (which is four feet square) was made, and though much exposed to the sun and water, yet it remains good; while simi lar doors, though much smaller, made of Teak, were so much decayed, a year ago, as to ren der it necessary to replace them.

In addition to my own experiments, I have lately learned that the decks of pinnaces to the eastward, about Chittagong, Dacca, &c. are made of this timber, because it bears the weather better than any other they know, without shrinking, or warping.

These favourable circumstances induce me to hope, that experiments will be made to ascertain its value when used for the bottoms, and upper works, of vessels, as well as for III. knees, curved timbers, &c.

86 3. G. *villosa. Roxb.*

Arboreous, spinous. *Leaves* opposite, petioled, trapeziform, rather sub-lobate, downy un derneath. *Racemes* terminal. *Bractes* lanceolate, cuspidate. *Drupes* spherical.

Radix deipara. *Rumph. Amb.* ii. *p.* 124. *t.* 39. Page Carey Ed.

A native of Pulo Pinang; from thence introduced by Dr. W. Hunter, into the Botanic garden at Calcutta, in 1802. In six years, the seedling plants had reached the size of small trees, and are in flower and fruit all the year round.

Trunk, in our young trees, straight, as thick as a man's leg. *Bark* olive-coloured. *Branches* numerous, spreading, and drooping in every direction; *young shoots* round, and villous. *Leaves* opposite, petioled, trapeziform, with the margins entire, except that the rounded side angles sometimes project into lobes, and the apex is generally acute, smooth on the upper side, pale and downy on the under one, from one to four inches long, and from one to two broad. *Stipules* none. *Racemes* terminal, simple, downy. *Flowers* opposite, pedicelled, drooping, and scarcely so large as in G. *asiatica*, dull yellow, on account of their being clothed with ferruginous pubescence. *Bractes* large, lanceolate, cuspidate, continuing till the flowers expand. *Calyx* small, obscurely four-toothed, with some large glands on the under side, as in G. *asiatica*, but larger and more numerous, permanent. *Corol* with a narrow, curved, cylindric tube, and oblique gibbous-campanulate throat. *Border* four-parted, of which the lower one is much larger, and is a continuation of the protruded side of the throat. *Filaments* curved, one of the pairs much longer. *Anthers* bifid. *Germ* round, smooth, four-celled, with one seed in each, attached to the top of the axis. *Style* as long as the long pair of filaments. *Stigma* of two, very unequal, acute lobes. *Drupe* spherical, size of a large cherry, fleshy, smooth, when ripe yellow, one-celled. *Nut* obovate, obscurely four-lobed, smooth, four-celled, perforated by a conic cavity with its wide end downwards. This perforation is more or less on one side of the centre, according to the number of fertile cells, which is generally one or two only. *Seed* solitary, obovate-oblong, a little compressed. *Integument* single, brown, spongy. *Perisperm* none. *Embryo* erect. *Cotyledons* conform to the seed, obcordate. *Plumula* two-lobed. *Radicle* minute, inferior. III. 87

4. G. *asiatica. Willd.* iii. *p.* 313.

Shrubby, spinous. *Leaves* sub-opposite, oval, and somewhat lobed, smooth. *Racemes* terminal, and from the forks of the branchlets. *Bractes* small, caducous. *Fruit* oval.

Jambosa silvestris parvifolia. *Rumph. Amb.* i. *p.* 129. t. 40.

Teling. Goomoodoo.

Is one of the most common bushes in every uncultivated place over the coast of Coromandel, and in flower and fruit all the year round.

Trunk, I cannot say it has any thing like a distinct one, as I have always found it in the state of a large, ramous shrub. *Branches* numerous, very irregular. *Thorns* axillary, opposite, horizontal, leaf-bearing. *Leaves* on the young shoots generally opposite, on the woody branchlets fascicled, petioled, broad oval, or obcordate, irregularly lobed, both sides smooth and shining, from one to an inch and a half long, and about one broad. *Racemes* from the divisions of the branches, or terminal. *Flowers* large, yellow, opposite, approximate, drooping. *Bractes* lanceolate, small, concave, caducous. *Corol* the upper lip largest. *Anthers*, all the four are two-parted. *Stigma* two-parted, the lower four times longer and revolute. *Nut* four-celled, generally two or three of them abortive.

The only use this shrub is applied to, is for fences and fuel.

5. G. *parviflora. Corom. pl.* 2. *N.* 162.

Shrubby, spinous. *Leaves* obovate, from entire to three-lobed. *Racemes* terminal.

Teling. Shieri-goomoodoo.

Arbuscula Bisnagarica. *Pluk. Alm. tab.* 14. *f.* 4. III.

Gmelina *coromandelica. Burm. Flor. In. p.* 32. 88

Is common in forests, and uncultivated places all over the coast. Flowering time October and November.

It differs from *asiatica* in the following respects.

1*st.* This is always a smaller plant, with much smaller leaves, although growing together on one spot, which is common. 2*nd.* The thorns are more numerous, and always present. 3*rd.* The racemes are terminal. 4*th.* The leaves have the quality of thickening cold water like those of *Pedalium murex*, and *Menispermum hirsutum.* The flowers and fruit are in both the same.

The natives employ the water impregnated with the gelatinous quality of the leaves as a ptisan for the cure of the heat of urine in gonorrhœa. Water is also rendered glutinous by the leaves of P. *murex*, by only turning them round in it, but the water soon returns to its original state. The leaves of this plant, G. *parvifolia*, must be gently bruised with the hand in the water and it remains mucilaginous till decomposed by fermentation.

AVICENNIA. Schreb. gen. N. 1063.

Calyx five-leaved, or five-parted. *Corol* bilabiate; *upper lip* emarginate; the *under* one three-parted, reflexed. *Capsule* leathery, cordate, one-seeded.

A. *tomentosa. Willd.* iii. 395.

Arboreous. *Leaves* opposite, obovate, hoary underneath.

Bontia germinans. Linn. sp. 891.

Beng. Bina.

Oepata. *Rheed. Mal.* iv. *t.* 45.

Is common in India, in low places near the mouths of rivers, where the spring-tides rise. Flowering time the hot season. In the Soondur-bun, *i. e.* the lower part of the Delta, of the Ganges, it grows to be a tree of considerable magnitude, the wood of which serves the natives for various economical purposes. On the Coromandel coast, where it is common, I have only found it in the state of a ramous shrub. III. 89

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Leaves opposite, short-petioled, obovate, and oval, entire, obtuse, very hoary underneath. *Panicles* terminal, trichotomous, bearing the flowers in terminal, single, rigid heads. *Flowers* numerous, small, of a dark dull yellow, when dry almost black. *Bractes* of the divisions of the panicle, opposite, ovate; of the calyx three-fold, one-flowered. *Calyx* five-leaved; the three bractes thereof may be reckoned three more. *Corol; tube* short, bilabiate; *upper lip* emarginate; the *lower* one of three deeply divided, equal, expanding segments. *Filaments* from the fissures of the corol. *Anthers* twin. *Germ* superior, ovate, downy. *Style* about the length of the stamens. *Stigma* of two, acute points.

LANTANA. Schreb. gen. N. 1026.

Calyx obscurely four-toothed. *Stigma* hook-refracted. *Drupe* with a trilocular nut, the lower one sterile.

L. *indica. R.*

Shrubby, straight, four-sided, hairy. *Leaves* opposite, cordate, serrate, rugose. *Peduncles* solitary, axillary, shorter than the leaves. *Heads* ovate. *Bractes* ovate-lanceolate. *Nut* two-celled.

A native of Mysore, from thence Dr. B. Heyne sent the seed to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and blossom during the rains.

Stem ligneous, perennial, erect, four-sided, clothed with short hairs, and tinged with dark purple. *Branches* few, and like the stem. *Leaves* opposite, short-petioled, cordate, swelling on the petioles, serrate, rugose, hairy underneath, from three two four inches long, and from two to three broad. *Stipules* none. *Peduncles* axillary, solitary, shorter than the leaves, expanding, hairy, angular, and coloured like the stem. *Heads* ovate. *Bractes* one-flowered, from cordate below, to lanceolate near the apex, where they are sterile, all are acute and hairy. *Flowers* numerous, small, of a beautiful light purple, inodorous. *Calyx* small, margin ciliate, and obscurely divided. *Drupe* globular, smooth, purple, the size of a small pea. *Nut* turbinate, two-celled, with a seed in each; no empty cell in this species.

III. 90

STREPTIUM.

Calyx five-toothed. *Corol* funnel-shaped; *tube* twisted; *border* five-parted, equal. *Germ* superior, four-celled; *cells* one-seeded; *attachment* inferior, two-partible. *Nut* wrapped in the permanent calyx. *Seed* solitary. *Embryo* erect, no perisperm.

S. *asperum. Corom. pl.* ii. *N.* 146.

Tortula *aspera. Linn. sp. pl. ed. Willd.* iii. 359.

Verbena *Forskaelei. Vahl. Symbol.* iii.

Teling. Obeera.

I have only found it in the vicinity of Samulkota, on the terraces and old walls of Pagodas. In flower during the wet and cold seasons, while young it looks well.

Stem woody, perennial, short, irregular; *branches* opposite, exactly four-sided, rough; the height of the whole plant from two to four feet. *Leaves* opposite, petioled, cordate, serrate, covered with stiff hooked hairs; from one to three inches long, and from one to two broad. *Petioles* channelled, rough. *Racemes* terminal, or in the cleft of the exterior branchlets, erect, very long; *rachis* four-sided, rough. *Bractes* solitary, one-flowered. *Flowers* towards the bottom of the raceme, remote, above approximated, small, white, *Calyx* one-leaved, oblong, gibbous, five-angled, five-grooved, five-toothed, covered with stiff, hooked hairs, permanent, closing and enlarging with the fruit, which it entirely covers. *Corol; tube* cylindric, rather longer than the calyx, twisted near the apex, a little curved; *border* five-parted; *divisions* obovate, equal. *Filaments* four, in the upper bent part of the tube. *Anthers* round, two-lobed, approaching by pairs. *Germ* four-celled, with one ovulum in each attached to the bottom of its cell. *Nut* wrapped in the permanent calyx, spontaneously separating into two, singly straight on the inside; gibbous on the outside, and there armed with obtuse hornlets, two-celled, with a large spurious cell or cavity on the inside. *Seeds* solitary, curved, clavate. *Integuments* single, pure white, and very thin. *Perisperm* none. *Embryo* white, conform to the seed, erect. *Colyledons* linear-oblong. *Plumula* minute. *Radicle* inferior, pointed.

III. 91

I have not found that this plant is put to any use.

LIMOSELLA. Schreb. gen. N. 1039.

Calyx from three to five-cleft. *Corol* from four to five-cleft. *Stamina* approximated by pairs. *Capsule* one or two-celled, two-valved, many-seeded.

L. *diandra. Willd.* iii. 342.

Creeping. *Leaves* paired, linear. *Scapes* solitary, as long as the leaves, one-flowered. *Capsules* two-celled.

An exceedingly small plant, found growing at the bottom of clear, standing, fresh water. *Stoles* numerous, creeping, filiform, jointed, so intricately interwoven, that a distinct specimen is not easily separated.

Leaves sessile, two at each joint, erect, linear, wedge-formed, obtuse; about three quarters of an inch long, and the sixteenth of an inch broad. *Peduncles* solitary, erect, between the pair of leaves, and of the same length, one-flowered. *Calyx* three-cleft; *segments* unequal. *Corol; tube* cylindric, a little curved, of the length of the calyx; *border* spreading, unequal; *upper division* largest, wedge-formed, three-toothed; *lateral segments* smaller and oval, the

lower one is the least of all. *Filaments* two, in the tube of the corol. *Anthers* oval. *Stigma* oblong. *Capsule* oval, covered by the calyx, two-celled, the receptacle is large, and in the centre, but the partition is exceedingly thin. *Seeds* numerous. 92

ERINUS. Schreb. gen. n. 1034.

Calyx five-leaved. *Corol* five-cleft, sub-equal. *Capsules* bilocular, many-seeded.

E. *bilabiatus. R.*

Annual, erect, villous. *Leaves* opposite. *Spikes* axillary and terminal, long-peduncled, crowded. *Corol* bilabiate.

This plant has been reared in the Botanic garden near Calcutta, from seeds received from the Moluccas. It blossoms and ripens its seed between October and December.

Stem annual, erect, villous, almost round. *Branches* few, opposite; the height of the whole plant about two feet. *Leaves* opposite, oblong, a little reflexed, slightly serrate; scabrous on both sides, length of the cauline leaves about two inches, those near the inflorescence under one inch. *Flowers* numerous, collected into round, cylindric, imbricated, terminal spikelets, or heads. *Bractes* three-fold, one-flowered, sub-clavate, hairy. *Calyx* five-leaved, on the base five-parted, hairy. *Corol* bilabiate, small, blue; *upper lip* emarginate; the *under* one three-lobed; *lobes* revolute. *Anthers* approaching by pairs, roundish. *Stigma* two-lobed. *Capsule* ovate, two-lobed, two-valved, when ripe the valves separate half way down; partitions double. *Seeds* numerous.

CAPRARIA. Schreb. gen. N. 1030.

Calyx five-parted. *Corol* campanulate. *Capsule* two-celled, two-valved, many-seeded.

1. C. *gratissima. Roxb.*

Annual, erect, with creeping roots. *Leaves* opposite, sub-sessile, oblong, serrate. *Flowers* axillary, solitary, sub-sessile. III. 93

Pola tsjira. *Rheed. Mal.* ix. *t.* 78.

This plant I have only found in rills of fresh water among the Circar mountains. It is annual with a creeping root, sending up many shoots, or ramous stems of from one to two feet high; they are round, smooth and jointed, and as thick as the little finger; all the joints under water emit many fibrous roots, or multifid, filiform leaves.

Leaves opposite, short-petioled, oblong, serrate, a little rugose, sprinkled on the under side with innumerable, glandular dots, about two and a half inches long, and one broad. *Flowers* axillary, generally solitary, short-peduncled, purple. *Calyx; upper divisions* largest, incumbent. *Corol* campanulate; *upper lip* broader and emarginate. *Nectary,* a yellow ring surrounding the base of the germ.

It is delightfully aromatic, and has a sweet pleasant taste.

2. C. *diffusa. R.*

Suffruticose, diffuse. *Leaves* opposite, petioled, lanceolar, obtuse, entire. *Spikes* axillary, and terminal, shorter than the leaves.

From Pegue it was introduced by the Rev. Mr. F. Carey into the Botanic garden at Calcutta, where it flowers and ripens its seeds during the whole of the dry season.

Stem scarcely any, but numerous, opposite, diffuse branches and their sub-divisions, spread close to the ground, all are round, and the younger parts harsh with very short hair; whole spread of the plant about two feet high. *Leaves* opposite, short-petioled, lanceolar, obtuse, entire; from one to three inches long, and under one in breadth. *Spikes,* or *racemes,* for the flowers are short-pedicelled, axillary, and terminal, clammy, villous, much shorter than the leaves. *Flowers* small, purple, opposite, and alternate. *Bractes* linear-lanceolate, one beneath each pedicel, and two pressing the calyx laterally. *Calyx* of five unequal, linear, villous, clammy segments, which are as long as the tube of the corol. *Corol* tubular. *Border* of five, nearly equal, rounded divisions. *Anthers* twin. *Germ* ovate-oblong, two-celled, with four vertical rows of seeds in each. *Style,* the length of the tube of the corol. *Stigma* of two very unequal, acute lobes. *Capsule* linear, scarcely so long as the permanent calyx, furrowed on opposite sides, two-celled, two-valved. *Partitions* contrary, composed of the incurved margins of the valves, and free from each other in the centre. *Seeds* numerous, minute, round, and tubercled. III. 94

STEMODIA. Schreb. gen. N. 1043.

Calyx five-parted. *Corol* bilabiate. *Stamina* four, with each filament two-cleft, two-anthered. *Capsule* two-celled.

1. S. *viscosa. Corom. pl.* ii. *N.* 163.

Annual, hairy and glutinous. *Leaves* opposite, stem-clasping, linear-cordate, serrate. *Flowers* axillary, solitary.

Teling. Boda-sarum.

A small, annual plant, found on dry rice fields after the crop has been cut. *Stem* annual, generally bent to one side, with many spreading branches from its base, four-sided, hairy, clammy; from six to twenty-four inches high. *Leaves* opposite, stem-clasping; below linear-oblong, above cordate, hairy, clammy. *Flowers* axillary, solitary, peduncled, small, of a violet colour. *Bractes* two, lanceolate, pressing on the calyx. *Corol; tube* compressed, longitudinally wrinkled, [illegible] the length of the calyx; *upper lip* broad, emarginated; the *under lip* three-parted. *Stamens* within the tube.

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The plant has a pleasant aromatic smell.

2. S. *ruderalis. Willd.* iii. 345, &c.

Annual, diffuse, downy. *Leaves* opposite, petioled, ovate, serrate. *Flowers* axillary, solitary, sub-sessile. *Calyx* five-toothed. *Corol* deeply two-cleft.

Found on old walls about Calcutta. It flowers during the rains.

Root ramous, seems perennial. *Stems* many, ascending, ramous, herbaceous, woody, somewhat viscous, the whole plant about twelve or eighteen inches high. *Leaves* opposite, petioled, ovate, deeply serrate, soft, a little hairy; about an inch long. *Petioles* shorter than the leaves, channelled. *Stipules* none. *Flowers* axillary, sub-sessile, solitary, opposite, small, yellow. *Calyx* ten-furrowed, five-toothed, permanent. *Corol* personate; *tube* the length of the calyx; both lips projecting, and shut; apex of the under lip broad, depending, three-toothed, of the upper one very narrow, bifid; inside of both hairy, and beautifully marked with small purple dots. *Filaments* and *anthers*, as in the genus. *Stigma* slightly two-lobed.

TORENIA. Schreb. gen. N. 1011.

Calyx bilabiate. *Corol* irregular, one pair of the filaments with a barren branchlet. *Capsule* two-celled, many-seeded; partition parallel.

1. T. *cordifolia. Corom. pl.* ii. *p.* 2. *f.* 161.

Annual, brachiate, four-sided. *Leaves* petioled, cordate, serrate. *Calyx* two-cleft, with divisions two and three-toothed.

Nut cordate, serrate. *Calyx* two-cleft, with divisions two and three-toothed.

Corosinam. *Rheed. Mal.* ix. *t.* 68.

A native of the Circars, appearing in the dry season.

2. T. *diffusa.*

Annual, diffuse. *Leaves* sessile, cordate, serrate. *Flowers* solitary, long-peduncled. *Calyx* five-parted, superior filaments with a sterile branch.

III. 96

Vandellia diffusa. *Willd.* iii. 343.

A native of Coromandel, where it appears during the rainy season.

3. T. *hians.*

Annual, creeping, four-sided. *Leaves* petioled, cordate, serrate. *Flowers* axillary, solitary, peduncled. *Calyx* five-winged. *Stigma* of two large, round, cordate lobes.

A native of Amboyna, Chittagong, &c. It flowers in the Botanic garden about the close of the rains; when its numerous, large, beautiful dark blue violet flowers are highly ornamental.

4. T. *multiflora.*

Annual, erect, ramous, four-sided, smooth. *Leaves* opposite, oblong, sub-serrate. *Flowers* terminal. *Calyx* five-parted. *Corol* bilabiate, superior filaments, with a sterile branch. *Capsules* ovate.

A native of Bengal, appearing in the rainy and cool season.

5. T. *varians.*

Annual, erect, four-sided, smooth. *Leaves* opposite, petioled, cordate, ovate, serrate. *Flowers* axillary, solitary. *Calyx* five-toothed. *Corol* ringent. Longer filaments, with a sterile branch. A native of Coromandel and Bengal, where it appears during the rainy season.

6. T. *vagans. R.*

Straggling, smooth. *Leaves* ovate, oblong, serrate. *Flowers* axillary, long-peduncled. *Calyx* winged, both lobes acute and entire.

An extensive rambler, a native of Chittagong, where it delights in moist shady places. *Flowers* large and blue, they appear in greatest profusion in October.

III. 97

COLUMNEA. Schreb. gen. N. 1064.

Calyx five-parted. *Corol* ringent. *Anthers* twin, connected by pairs in a coronet. *Capsule* two-celled.

1. C. *balsamica. R.*

Annual, erect, stoloniferous. *Leaves* sub-verticelled, pinnatifid. *Peduncles* axillary, solitary, one-flowered.

Tsjeria-manga-mari. *Rheed. Mal.* ix. *t.* 85.

Tsadaen-tsjira. *Rheed. Mal.* xii. *t.* 36 seems the same.

Hottonia. *Burm. Zeyl. t.* 55. *f.* 1.

Gratiola *trifida. Linn. sp. pl. ed. Willd.* i. 104.

Beng. Kurpoor.

Hottonia *Indica. Linn. sp. pl. ed. Willd.* 1813.

Ruellia balsamica. *König's Mss.*

This is a small annual; the general height about six inches, a native of marshy places, appears and flowers during the rainy and cold seasons.

Roots creeping. *Stems* erect, sometimes ramous, round, jointed, smooth. *Leaves* sessile, the lower are generally verticelled, or nearly so, above three-fold, and opposite; some are pinnatifid, some lobate, and some simply linear-lanceolate, all are serrate toward the apex, smooth on both sides, generally less than an inch long. *Peduncles* solitary, axillary, rather longer than the leaves, one-flowered, sometimes they are opposite and even tern towards the the top of the plant. *Bractes* two, pressing on the calyx. *Stigma* large, in shape like a dog's head, with the under division very long, and ascending. *Capsule* long, two-celled, four-valved;

receptacle large. *Seeds* numerous. Page Carey Ed.

As König observes, the plant has a strong terebinthinaceous smell, it is at the same time very grateful. The taste is that of a warm aromatic.

2. C. *Heterophylla.* III.

Annual; *root* creeping. *Lower leaves* verticelled, when under water filiformly-pinnatifid; *floral leaves* sessile. *Corol* somewhat bilabiate. 98

A native of Bengal, in wet places, during the dry season.

3. C. *tomentosa.*

Annual, diffuse. *Leaves* generally opposite, wedge-shaped, with gashed margins. *Racemes* terminal, with ample five-cleft calyx, and ringent corol.

A native of Bengal, appearing during the cool season.

4. C. *minuta.*

Annual, spreading, four-sided. *Leaves* sessile, ovate-cordate, serrulate. *Flowers* axillary, long-peduncled. *Calyx* five-cleft. *Corol* ringent. *Capsules* globular.

A native of various parts of India, appearing during the rainy and cold season.

GERARDIA. Schreb. gen. N. 1004.

Calyx five-cleft. *Corol* irregular, sub-campanulate; *lower lip* three-parted, lobes emarginate, the middle segment two-parted. *Capsule* from two to three-celled, from two to three-valved.

G. *delphinifolia. Corom. pl.* i. *N.* 90.

Annual, erect, ramous. *Leaves* pinnatifid, with filiform segments.

Antirhhina adfinis madraspatam cappilaceo folio. *Pluk. p.* 17. *t.* 358. *f.* 3.

A very elegant, erect, annual plant; a native of the mountainous parts of the country. Flowers during the wet and cold season.

Stem annual, straight, ramous, four-angled, four-grooved, about three or four feet high; spotted with dark purple. *Branches* opposite, like the stem. *Leaves* opposite, irregularly pinnatifid; *divisions* linear, as in *Ipomœa quamoclit. Flowers* axillary, solitary, short-peduncled, large, rose-coloured. *Bractes* two, filiform, pressing on the calyx laterally. *Calyx* one-leaved, five-cleft; divisions linear, erect, permanent. *Corol* regular; *tube* sub-campanulate, two or three times longer than the calyx; *border* five-parted; *segments* equal, rounded. *Filaments* four, the *superior* pair ending in a recurved hook, the *inferior* in an erect horn. *Anthers* linear, the *superior* pair approach archways, so that their apices meet; the *lower* pair firmly united their whole length. *Germ* ovate. *Style* length of the tube. *Stigma* enlarged, entire. III. 99

Capsule oblong, about as long as the calyx, two-celled, two-valved; *receptacle* columnar. *Seeds* numerous.

DIGITALIS. Schreb. gen. N. 1017.

Calyx five-parted, irregularly campanulate, five-cleft, gibbous. *Capsule* ovate, two-celled.

D. *stricta.*

Annual, straight, scabrous. *Leaves* opposite, linear, scabrous. *Flowers* solitary. *Calyx* pitcher-shaped, with a slit on the under side.

An elegant annual species, found on pasture ground over Bengal. Flowering time the rainy season.

Stem straight, from one to two feet high; *branches* few, opposite, nearly straight, all covered with much short, harsh hair; towards the apex somewhat four-sided. *Leaves* opposite, sessile, linear, almost entire, very scabrous, size very various. *Flowers* sub-sessile, the *inferior* ones nearly opposite, the *upper* one alternate; pretty large for the size of the plant.

Bractes two pressing on the calyx laterally, they are of a lanceolate shape, and shorter than the calyx. *Calyx* ovate, nearly shut at the mouth, five-ridged, scabrous, slit underneath.

Corol, tube somewhat bellied, twice as long as the calyx, colour a deep purplish red. *Border* of five broad, nearly equal, obcordate, rose-coloured divisions. *Filaments* woolly. *Anthers* of two lobes, the smaller of which ends in a sharp projecting hornlet. III. 100

CELSIA. Schreb. gen. N. 1015.

Calyx five-parted. *Corol* rotate. *Filaments* bearded. *Capsule* two-celled.

C. *coromandeliana. Vahl. Symb.* iii. 79. *Willd.* iii. 280.

Annual, erect, ramous, downy. *Lower leaves* lyrate, *superior* sessile, cordate. *Pedicels* as long as the bractes, divisions of the calyx lanceolate, entire, and serrulate.

Beng. Kookshima.

A native of various parts of India, appearing during the dry season, and generally as a weed in gardens, or on cultivated land.

SESASMUM. Schreb. gen. N. 1048.

Calyx five-parted. *Corol* irregularly campanulate, five-lobed, with the lower one larger, and protruding. *Stigma* of two equal, lanceolate lobes. *Capsules* four-celled, two-valved.

S. *orientale. Willd.* iii. 358.

Leaves ternate and simple, the *superior* always simple and narrower.

Sans. Tila.

Pers. Roghen.

Arab. Dulin.

Page Carey Ed.

Teling. Novu.

Gingeli, is the name by which it is generally known amongst Europeans on the Coromandel coast.

III. Schit-elu. *Rheed. Mal.* ix. *f.* 54. and I believe fig. 55 is also the same.

101 This species or variety, is by far the most generally cultivated in the warmer parts of Asia. It is annual, and in a good soil grows generally to be about three or four feet high. I never found it in a wild state.

My figure of this plant, called S. *indicum* by Linnæus, is the *Krishna til* of the Hindoos, I can at most make only a variety of this species; it is larger, more ramous, the stem and branches tinged with a rusty, reddish colour; the *leaves* a darker green; but in situation and structure the same. The flowers are deeper tinged with red, and the seed darker coloured. Both are described by Rumphius, p. 204. &c. of the 5th volume of his *Herbarium Amboinense*. *Fig.* 1. *t.* 76. of the same volume is a tolerable diminished figure of this variety. Their greatest difference, however, appears in the seed, and harvest time.

The former, S. *orientale*, is sown in Bengal in February, and the crop got in three months afterwards, so that the dews, and the little remaining moisture of the earth, are the only sources of humidity by which it can benefit, as this is in general a period of drought. S. *indicum* is sown on high places, about the beginning of the rains, June; and the crop cut down in September.

BIGNONIA. Schreb. gen. N. 1018.

Calyx various. *Corol*, with the throat campanulate, and a five-cleft border. *Germ* superior, two-celled; *cells* many-seeded; *attachment* interior. *Silique* bilocular (partition contrary), containing many thin winged seeds. *Embryo* centripetal, no perisperm.

1. B. *undulata. R.*

Arboreous. *Leaves* opposite, simple, linear-lanceolate, much waved. *Racemes* lateral. *Calyx* campanulate, with the mouth cut into five, short emarginate segments. *Silique* linear, a little
III. compressed, smooth, partition contrary.

102 A native of Hindoostan, from thence sent to the Botanic garden by Colonel Hardwicke, where it flowers in March, and ripens its seed in May. When in full flower it is one of the most beautiful small trees I have seen.

Trunk erect, in trees eight years old, as thick as a man's thigh, and the whole tree about twenty-five feet high. *Bark* scabrous, of a brownish ash-colour. *Branchlets* drooping, like the weeping willows. *Leaves* simple, opposite, petioled, drooping, linear-lanceolate, apex scarcely pointed, entire, much waved, clothed with minute micaceous scales. *Petioles* slender, channelled. *Stipules* none. *Racemes* lateral, from branchlets of one or two years growth, two or three inches long, five or six-flowered. *Bractes*, one at the base of each pedicel, and an opposite pair a little further up, caducous. *Flowers* very large, erect, orange-coloured, inodorous. *Calyx* campanulate, five-toothed; *segments* short, rounded, often emarginate. *Corol; tube* obliquely campanulate. *Border* four-parted; the *upper division* larger, and divided into two rounded lobes; the *under* three, equal, and nearly round, with the margins slightly waved. *Filaments* five, the single one small, and abortive. *Anthers* double. *Germ* linear, two-celled, with numerous ovula in each, attached to two longitudinal swellings on each side of the partition. *Style* the length of the stamina. *Stigma* of two thin, oval, acute lobes. *Silique* linear, curved, considerably flattened, so as to bring the sutures into the middle of the sides; about six or eight inches long by one in circumference, two-celled, two-valved; *valves* smooth, thin, and of a light brown colour. *Partition* thin, of a dark brownish black, contrary, that is, crossing the sutures, and attached to the middle of the valves. *Seeds* many, imbricate, thin, with a very thin white membranaceous wing all round; attached to the partition about half way between its middle and the margins. *Perisperm* none. *Embryo* with two-lobed cotyledons, and the point
III. of the radicle immediately within the umbilicus.

103 2. B. *comosa.*

Tender parts very downy. *Leaves* simple, opposite, cordate, entire. *Corymbs* terminal, short, leafly. *Calyces* five-cleft. *Corol*, with a long, slender tube, and bilabiate border.

A native of the Moluccas.

3. B. *spathacea. Corom. pl.* 2. *N.* 144.

Arboreous. *Leaves* opposite, pinnate; *leaflets*, from three to seven pairs, with an odd one, roundish. *Racemes* terminal. *Calyx* spathaceous. *Corol* infundibuliform, oblique, long, slender, much curved.

B. *falcata. Kön. Mss. in. B. H.*

Teling. Woody.

A small thin tree, a native of most of the forests on the coast, flowers during the hot season.

Trunk very irregular, both in size and shape, the *branches* also. *Bark* light ash-colour; *young shoots* covered with whitish down. *Leaves* opposite and alternate, pinnate, with an odd one about six inches long. *Leaflets* opposite, from two to three pairs, nearly orbicular, entire, downy; from one to two inches long, and about as much broad. *Racemes* terminal, erect, as long as the leaves, few-flowered. *Flowers* white, pretty large. *Calyx*, a spathe, two-thirds open on the convex side. *Corol; tube* longer than the calyx, cylindric; *border*, flat *divisions* equal, oblong. *Nectary*, a dark purple ring, surrounding the base of the germ. *Stamens*, there is a fifth sterile filament. *Anthers* oval. *Stigma* two-lobed. *Silique* linear, about twelve inches long, pendulous, twisted in various forms.

4. B. *crispa. Buch.* Page Carey Ed.

Arboreous. *Leaves* pinnate; *leaflets* five or seven, oblong, entire. *Calyx* spathaceous. *Corol* hypocrateriform, with segments of the border sub-equal, and much curled. *Silique* linear; *partition* contrary. III.

A native of Mysore, where it was found by Dr. Buchanan, who sent seeds to the Botanic garden at Calcutta, where in seven years the trees were about twenty feet high; it blossoms in May and June; *seed* ripe in December. 104

Trunk straight, covered with smooth, ash-coloured bark. *Branches* tolerably erect, but not numerous. *Leaves* opposite, pinnate, from six to ten inches long; in Bengal, permanent. *Leaflets* five or seven, rarely ternate, petioled, oblong, entire, villous while young, from two to four inches long. *Racemes* solitary, terminal, bearing a few opposite, long-pedicelled, large, pure white, fragrant flowers, which expand in the evening, and drop in the morning. *Calyx* a perfect spathe, opening on the upper side, shorter than the tube of the corol, deciduous with or soon after the corol. *Corol* salver-shaped. *Tube* sub-cylindric. *Border* of five, somewhat reniform, equal segments; all much and beautifully curled. *Stamens*, a fifth, small, sterile filament. *Anthers* twin. *Germ* conical, its base surrounded with a glandular ring, two-celled, in each many ovula attached to a longitudinal, elevated receptacle, which runs along the middle of the partition. *Style* shorter than the tube of the corol. *Stigma* of two, thin, oblong lobes. *Silique* linear, pendulous, about twelve or fifteen inches long, by one and a half in circumference, variously bent, obtuse-pointed, colour brown and scabrous, with still paler specks; a transverse section forms a very exact ellipsis, two-celled. *Partition* thick and spongy, contrary to the valves, and attached to the middle of them. *Seeds* numerous, winged at both ends, disposed in two imbricate rows in each cell, and attached to the middle of the opposite sides of the thick spongy partition, where it joins the valves, being the part most remote from its sutures. *Perisperm* none. *Embryo* straight. *Cotyledons* two-lobed; *lobes* nearly orbicular. *Radicle* oval, immediately within the umbilicus.

5. B. *suaveolens. R.*

Arboreous. *Leaves* pinnate; *leaflets* three pairs, oval, serrulate. *Panicles* terminal, thin, first divisions brachiate. *Corol* woolly. *Silique* cylindric. III.

Patali the Sanscrit name. See *Asiatic Res.* 291. 105

Beng. Parul.

Hind. Paral.

B. *padri. Kön. Mss.* and *B. H.*

A middle sized tree, a native of Bengal, and of the southern parts of the Coromandel coast. Flowering time the hot season.

Trunk tolerably erect, though not straight. *Bark* ash-coloured, and somewhat scabrous. *Leaves* opposite, pinnate, with an odd one from twelve to twenty-four inches long. *Leaflets* opposite, from two to four pairs, oval, with long, bluntish, narrow points, slightly serrate, having both sides downy while young, and when full grown not downy and feeling harsh; the exterior pair and odd one about six inches long, by three or four broad; the inferior pair, or pairs, smaller. *Petioles* swelled at the base, roundish, when old scabrous. *Panicles* terminal, composed of a few spreading branchlets; the first and second pairs thereof opposite, the superior dichotomous, with a solitary, pedicelled flower in the forks; all are downy, and somewhat viscid. *Flowers* large, of a dark, dull, crimson colour, exquisitely fragrant. *Calyx* campanulate. *Border* four-cleft; *upper divisions* with two minute points, outside a little villous. *Corol*; *throat* ample, woolly, convex above, flat and plaited beneath. *Border*, the *upper divisions* shorter, erect; the *three inferior* ones longer and projecting, with the margins of all much curled. *Filaments* four, fertile, and between them a small sterile one. *Anthers* twin. *Germ* oblong, clavated on a glandular receptacle. *Stigma* two-lobed.

6. B. *grandiflora. Willd.* iii. 302.

Shrubby, scandent. *Leaves* pinnate; *leaflets* ovate, serrate. *Panicles* terminal, pendulous, divisions of the calyx lanceolate, length of the corol. III.

Chin. Tung-vong-fa. 106

A large scandent shrub, a native of China, runs over bushes, &c. emitting roots from the joints; the bark cracks, and peels off; otherwise it is smooth.

Young shoots spotted with dark purple. *Leaves* opposite, pinnate, from six to ten inches long. *Leaflets* opposite, from three to four pairs, with an odd one, oval, deeply serrate, pointed, tolerably smooth. *Petioles* deeply channelled, as if winged. *Stipules* none. *Flowers* terminal, forming pendulous, cross-armed panicles, they are large, on the outside of a tawny orange colour, on the inside of a tolerably bright, reddish-orange, with brighter streaks. *Calyx* and *corol* as in the genus. *Nectary*, a glandular, crenulate ring surrounding the base of the germ. *Stamens* a fifth sterile filament between the short pair. *Stigma* two-parted; anterior lip recurved. When in flower it is very ornamental.

7. B. *chelonoides. Willd.* iii. 304.

Arboreous. *Leaves* pinnate; *leaflets* about four-paired, with an odd one, from ovate to oblong, entire, cuneiform. *Panicles* terminal. *Corol* bilabiate. *Siliques* pendulous, long, slender, sub-cylindric, with sharp edges, and variously curved.

Padri. *Rheed. Mal.* vi. *t.* 26.

Tam. Pou-padyra-marum.

Teling. Tagada.

A native of the mountainous parts of the coast of Coromandel, where it grows to be a large tree. Flowers during the hot and rainy seasons, and the seed ripens in December and January.

Page Carey Ed. III. 107

Trunk very straight, and of a great height and thickness. *Bark* thick, scabrous, brown. *Branches* very numerous, the inferior horizontal, above gradually becoming more and more erect to the top. *Leaves* opposite, pinnate, with an odd one, about twelve inches long. *Leaflets* opposite, short-petioled, generally four pair, the inferior smallest, obliquely oval, pointed, sometimes slightly notched about the margins, when young downy, afterwards smooth, about four inches long, by two broad. *Petioles* about nine inches long, channelled, smooth. *Stipules* none. *Panicles* terminal, the larger ramifications decussate, the smaller or terminal two-forked, with a sessile flower in the cleft. *Peduncles* and *pedicels* round, covered with oblong, gray, scabrous specks. *Bractes* small, caducous. *Flowers* pretty large, yellow, very fragrant. *Calyx* five-notched. *Nectary* a yellow fleshy ring surrounding the base of the germ. *Filaments*, there is a fifth sterile one between the lower pair. *Anthers* double. *Stigma* two-cleft. *Silique* very long, slender, twisted; *receptacle* of the seeds spongy, white, with alternate notches on the sides for the seeds to lodge in.

The wood of this tree is high coloured, hard, durable, and of much use amongst the inhabitants of the hills, where it is plentiful.

8. B. *quadrilocularis. Corom. pl.* 2. *N.* 145.

Arboreous. *Leaves* three-fold, or scattered, pinnate; *leaflets* from four to five pairs, with an odd one, serrate, smooth. *Panicles* terminal, dense, downy. *Siliques* linear, lanceolate, four-celled.

A large tree, a native of the Circar mountains. Flowers during the beginning of the hot season.

Trunk straight, and of considerable height. *Bark* gray, with a few scabrous spots. *Branches* numerous, spreading, forming a large shady head. *Leaves* about the extremities of the branchlets, generally three-fold, unequally pinnate, from twelve to twenty-four inches long. *Leaflets*, from four to five pairs, opposite, oblong, serrate, acute, smooth. *Stipules* none. *Panicles* terminal, erect, large, dense, many-flowered, very downy. *Bractes* scarcely any. *Flowers* large, rose-coloured, delightfully fragrant. *Calyx* generally two-parted, with the *upper lip* two-cleft, very downy. *Corol; border* five-parted; *divisions* equal, with their margins elegantly waved. *Stamens*, here is also a fifth sterile filament. *Anthers* double. *Nectary* as in B. *spathacea*. *Stigma* two-cleft. *Silique* erect, straight, linear, pointed, pretty smooth, twelve inches long, two broad, and half an inch thick, four-celled, two-valved, the dissepiment is enlarged in the middle on each side, with a sharp ridge which touches the sides of the valve, dividing each of the usual cells into two; into these ridges the seeds are affixed, hence I have taken my specific name.

III. 108

The wood of this tree is employed for many purposes by the natives.

9. B. *stipulata. R.*

Arboreous, tender parts villous. *Leaves* pinnate; *leaflets* from four to six pairs, from oval to oblong-elliptic; common petiole channelled. *Stipules* a tuft of sessile, orbicular ones in each axill.

A large tree, a native of Pegue, from thence introduced by the Rev. Mr. F. Carey, into the Botanic garden at Calcutta, where in two years it rose to the height of ten feet, with a simple trunk, which is considerably four-cornered toward the top.

Leaves opposite, about two feet long; *leaflets* from nine to fourteen, the largest of them a foot long, by six inches broad. *Common petiole* much swelled at the insertion of the leaflets, with a channel running down the upper edge. It has not yet blossomed in Bengal, but the siliques sent from Pegue were cylindric.

10. B. *xylocarpa. R.*

Arboreous. *Leaves* bi- and tri-pinnate; *leaflets* from obliquely oblong to semi-cordate. *Panicles* terminal; *segments* of the border of the corol round, and curled. *Siliques* linear, crooked, ligneous, and tubercled.

A tall, elegant tree, a native of Soonda, where it was first observed by Dr. Andrew Berry, and by him introduced into the Botanic garden at Calcutta, where in six years the young trees were about twenty, or twenty-five feet high; they blossom in March, April, May and June, and the seed takes about one year to ripen.

III. 109

Trunk very straight. *Bark* ash-coloured, rather spongy, and considerably cracked. *Branches* few and spreading but little. *Leaves* opposite, bi- and tri-pinnate, from one to four feet long; in Bengal they are deciduous in the cool months of December and January, and appear with the flowers in April and May. *Leaflets* short-petioled, from semi-cordate to obliquely-oblong, entire, pointed, hard though void of pubescence, from two to five inches long. *Petioles* common and partial, channelled, and scabrous, with numerous, elevated gray specks. *Panicles* terminal, ramifications thereof opposite, or tern, two, three, or more times dichotomous, with a single flower in the forks, slightly pubescent. *Bractes* ovate-oblong, solitary on the outside of the divisions only. *Flowers* large, white, with a tinge of yellow, and delightfully fragrant. *Calyx* campanulate, coloured, unequally five-toothed. *Corol*, with a short-cylindric tube, large, campanulate throat, and five-parted border; *segments* sub-orbicular, nearly equal, and much curled. *Stamina* as in the family, with a small fifth sterile one. *Germ* oblong, an annular gland round its base, two-celled, with numerous seeds attached to two, thick, equi-distant receptacles on each side of the partition. *Style* the length of the stamina. *Stigma* of two oblong, thin lobes. *Siliques* linear, variously bent, about two feet long; the greatest diameter one inch and a half, and parallel with the valves; and the transverse one, one inch; of a very hard, woody texture, and extremely rough, with numerous, large, irregular, hard tubercles, which would render it a dangerous bludgeon, one-celled, two-valved. *Partition* contrary, sub-cylindric, spongy. *Seeds* numerous, winged, small. *Perisperm* none. *Cotyledons* thin, near-

ly round, emarginate. *Radicle* short, pointing to the umbilicus.

11. B. *indica. Willd.* iii. 306.

Arboreous. *Leaves* supra-decompound. *Flowers* pentandrous. *Siliques* long, linear, compressed.

Bignonia *pentandra. Lourier. Cochin Ch.* 460.

Palega pajoneli. *Rheed. Mal.* i. *t.* 43 and 44.

Shyonaka, and *Mundooka-purna*, two of its Sanscrit names.

Hind. Shyona.

Tam. Vanga-marum.

Teling. Pampena.

Is one of the tallest trees on the coast, grows up amongst the mountains chiefly. Flowering time the beginning of the wet season. *Seed* ripens in January and February.

Trunk very straight, and very high, but thin in proportion. *Bark* smooth. *Branches* opposite, decussate. *Leaves* opposite, decussate, supra-decompound; from four, to six feet long. *Leaflets* obliquely-cordate, pointed, smooth, from three to six inches long, and from two to four broad. *Peduncles* and *pedicels* round, scabrous. *Racemes* terminal, secund, erect, rigid, lower two-thirds naked, scabrous, and somewhat quadrangular; *upper* third part imbricated on one side, with very large, fleshy, dark red flowers. *Bractes*, scarcely any. *Calyx* campanulate, entire, lasting. *Corol* campanulate. *Border* two-lipped; *upper* two-cleft, *under* three-cleft; *segments* wrinkled nearly. *Filaments* five, the exterior pair longest, bending in under the upper lip of the corol; at the base very woolly. *Anthers* five pairs, singly oblong, bursting on the under side. *Nectary*, a large, fleshy, somewhat pentagonal body surrounding the base of the germ. *Germ* oblong. *Style* the length of the stamens, hollow its whole length; *mouth* funnel-shaped, opening betwen the two membranaceous, orbicular lobes of the stigma. *Silique* very large, retrofracted, transversely compressed, somewhat curved, with the convexity upwards. *Seeds* numerous, membranaceous, surrounded with a large, delicate membranaceous wing. III.

The wood of this tree is said to be soft and spongy, so much as to render it unfit for use; at least I have never been able to discover any that it is put to. 111

12. B. *suberosa. R.*

Arboreous. *Bark* deeply cracked, and spongy. *Leaves* supra-decompound; *leaflets* subcordate, entire. *Panicles* terminal. *Anthers* calcarate. *Silique* linear, thin.

Millingtonia hortensis. *Willd.* iii. 382.

The native country of this beautiful tree, I have not been able to discover; all I can learn is, that some plants or seeds were brought from the Rajah of Tanjore's garden to Madras, from thence one plant was procured for the Company's Botanic garden at Calcutta, about fifteen years ago. It is now, when twelve years old, an elegant tree of about fifty feet in height. Is in blossom about the close of the rains and the seed ripens in March.

Trunk straight. *Bark* deeply cracked in various directions, of a soft, spongy nature. The wood is white, firm, and close-grained, and promises to be valuable. *Leaves* opposite, supra-decompound, about two feet long. *Leaflets* sub-cordate, with long taper obtuse points; *margins* entire, of a deep green colour, smooth on both sides, from one to three inches long and broad. *Petioles* and *petiolets* a little chanelled. *Panicles* terminal, solitary, cross-armed, large, broad-ovate. *Ramifications* horizontal, the first trichotomous, then dichotomous, with generally a single flower in the fork. *Bractes* minute. *Flowers* numerous, large, pure white, like many of the other species of this charming family delightfully fragrant. *Calyx* very small, slightly five-parted; *divisions* nearly equal. *Corol* infundibuliform. *Tube* from two to three inches long, slender and cylindric. *Border* four-parted; the *upper* division broader, and nearly half two-cleft. *Filaments* only four. *Anthers* calcarate. *Germ* oblong. *Style* as long as the corol. III. *Stigma* bilabiate. *Silique* slender, linear, thin, pointed, pretty smooth, two-celled; about twelve 112 inches long, by three quarters of an inch broad, and one line thick. *Partition* parallel. *Seeds* numerous, round, very thin, surrounded with a remarkably fine transparent wing. *Perisperm* none. *Embryo* with two reniform, emarginate cotyledons, and the radicle pointing directly to the umbilicus.

INCARVILLIA. Juss. Willd.

Gen. Char. *Calyx* campanulate, five-parted. *Corol* with an oblique gibbous tube, and unequally five-parted border. *Germ* superior, four-celled; *cells* many-seeded, attached to the involute margins of the partitions. *Capsule* siliqua-form, one-celled, four-valved. *Seeds* numerous, winged. *Embryo* inverse, without perisperm.

1. I. *parasitica. Roxb.*

Shrubby, parasitic, smooth. *Leaves* opposite, lanceolar, veinless, fleshy. *Umbels* terminal.

A native of the forests which cover the Garrow hills, where it is found growing on trees; but shows a partiality for such places as retain decayed vegetable matter. In the Botanic garden it grows freely in a soil composed of rotten wood and garden mould. Flowering time the rainy season, when nothing can exceed the beauty of its numerous, large, pendulous, crimson-yellow flowers, approaching in shape and size to those of *Digitalis purpurea. Seed* ripens in September and October.

Stem scarcely any, but several, rather succulent, smooth branches, with swelled joints, from which the fibrous roots issue. *Leaves* opposite, or nearly so, short, fleshy, petioled, lanceolar, acuminate, with the margins more or less curled, of a firm, fleshy, and veinless substance, from four to six inches long, by one broad. *Umbellets* terminal, solitary, sessile, simple,

Carey Ed.
111. many-flowered. *Flowers* large, drooping; *colour*, a beautiful mixture of orange and crimson.
113 *Bractes* an oblong caducous one at the base of each pedicel. *Calyx* tubular, somewhat *gibbous; mouth* five-parted. *Corol* tubular, curved. *Tube* somewhat ventricose, villous on the outside; *mouth* oblique, and divided into five, nearly equal, semicircular segments, one above and two on each side. *Filaments* four, didynamous, extend beyond the mouth of the tube. *Anthers* linear, *apices* united. *Germ* superior, linear, smooth; *base* embraced by a nectarial ring, four-celled; *ovula* numerous, attached to the incurved margins of the partitions. *Style*, the length of the germ, or more protruded beyond the anther. *Stigma* entire, fleshy, sub-infundibuliform. *Capsule* siliquose, pendulous, long and very slender, being about twelve inches long, and scarcely so thick as a quill, smooth and brown, with a groove on the opposite sides, four-celled, two-valved. *Valves* thin, almost membranaceous. *Seeds* numerous, minute, imbricated, cylindric, rough, from the apex two long rows and from the base one, they are attached to the rolled-in edges of the valves of the capsule, as in the germ. *Perisperm* none. *Embryo* cylindric, inverse. *Cotyledons* oblong, not half the length of the whole embryo. *Radicle* cylindric, superior; when vegetation begins, the structure of the parts becomes evident, the apex of the radicle first projects, from which innumerable, minute rays issue, and lay hold of the soil, or rather bark of the tree, they are sown on, as is the case in other parasites.

2. I. *oblongifolia. R.*

Shrubby, downy. *Leaves* opposite, unequally ovate-oblong, acuminate, downy, serrulate. *Cymes* axillary.

Common in moist vallies in the province of Chittagong. Flowers in October, and the seed ripens during the cool season. It is rather a small shrub, with thick, somewhat four-cornered, very tomentose branches.

Leaves opposite or tern, long-petioled, from six to twelve inches long, villous, one side
III. broader, and running further down on the petiole. *Peduncles* axillary, solitary, dichotomous,
114 with a flower in the fork; *divisions* from three to six-flowered, all very villous. *Flowers* large, like those of *Martinia diandra; colour* a mixture of whitish red, tinged with yellow. One pair of the *filaments* slender, and abortive; the other thick and villous, with large, two-lobed anthers, without any thing like a spur, or arista. The capsules are not above one-third, or one-fourth the length of I. *parasitica*, but rather thicker; and the seeds are flat and winged with a membranaceous margin all round.

PEDALIUM. Schreb. gen. N. 1067.

Calyx five-parted. *Corol* sub-equal, with border five-cleft. *Nut* corky, four-cornered, thorny on the angles, two-celled. *Seeds* two-fold.

P. *murex. Willd.* iii. 401.

Teling. Yeanaga-pabiar.

Cuca-mullu. *Rheed. Mal.* x. *t.* 72.

Tam. Anci-nerunshil.

A pretty large, succulent, ramous, annual plant, growing every where, but chiefly near the sea on the coast of Coromandel, where there is a tolerably moist, sandy soil, which it delights in. Flowering time, the rainy and cold seasons.

Root annual, ramous, of a deep orange colour. *Stem* scarcely any. *Branches* nearly opposite, spreading, with their extremities erect, round, and smooth; from six to twenty-four inches long. *Leaves* opposite, petioled, oval, irregularly dentate, truncate, three-nerved, pretty smooth; from two to three inches long, by one and a half or two inches broad. *Petioles* channelled, about two inches long. *Flowers* axillary, short-peduncled, single, pretty large, yellow, erect; on each side of their insertion, is a small, round, brown gland. *Bractes* no other than
III. the above-mentioned glands.
115 All that I can add to the description in the *Genera plantarum*, is, that between the fertile stamens, there is a short fifth filament, with a sterile, orange-coloured head.

The plant, when fresh, has the singular property of rendering water, or milk, either cold or hot mucilaginous; more or less so in proportion to the quantity of the plant used, and without altering the taste, colour or smell of the liquid. This effect goes off in the course of eight or twelve hours, leaving the liquid in its former state. Water rendered mucilaginous by this herb is sweetened with sugar, and given when fresh made, as a ptisan for the heat of urine in gonorrhœas by the natives on the coast of Coromandel.

Butter-milk is often sold in the markets in India, and in order to make a greater profit on their merchandize, they dilute it with water, and then thicken the whole by turning it round a few times with a few fresh leafy branches of this plant, which makes the adulterated butter-milk seem rich, and of the best sort.

CYRILLA. L. Herit.

Calyx five-leaved, or five-parted. *Corol* declined, funnel-formed; *border* five-parted, nearly equal. *Capsule* two-celled, many-seeded.

C. *aquatica. Corom. pl.* ii. *N.* 189.

Annual. *Leaves* verticelled, lanceolate, three or more nerved, serrate. *Racemes* terminal, recurvate.

Teling. Bagga-pattee.

A very beautiful and uncommonly curious plant, a native of the borders of pools, &c. of standing water, appearing and flowering in the wet and cold seasons.

Root creeping, annual. *Stems* erect, one or two feet high, round, jointed, a little hairy. *Leaves*, the lower ones, and they are generally under water, verticelled, number in the verticel uncertain, pinnatifid; *division* filiform, above water they are three-fold, sessile, broad-lanceolate, from three to seven-nerved, serrate, smooth. *Racemes* terminal, drooping, verticelled, many-flowered. *Bractes* three-fold, cordate, or like the leaves, but smaller, one-flowered. *Flowers* large, of a beautiful bluish colour. *Corol* sub-campanulate. *Anthers*, both pairs double, and connected. Page Carey Ed. III. 116

The plant possesses a considerable share of fragrance.

CLASS XV.

TETRADYNAMIA SILICULOSA.

LEPIDIUM. Schreb. gen. N. 1077.

Silicle emarginate, cordate, many-seeded. *Valves* keeled, contrary.

1. L. *Thlaspi. R.*

Annual, erect. *Primary leaves* sub-petioled, superior, with stem-clasping, sagittate base, all more or less cuneate, lanceolate, and remotely serrate. *Flowers* tetradynamous. *Silicles* round, with a broad thin border.

A native of Nepal in corn fields, during the cool season.

2. L. *sativum. Willd.* iii. 435.

Flowers tetradynamous. *Leaves* oblong, multifid.

Pers. Seereezak.

Beng. Halim.

Arab. Reshad.

Universally cultivated in the warmer parts of Asia, during the cool season.

TETRADYNAMIA SILIQUOSA.

BRASSICA. Schreb. gen. N. 1096.

Calyx erect, converging. *Seeds* globular. A gland between the shorter stamens and pistil, and between the longer and the calyx. III. 117

1. B. *Rapa. Willd.* iii. 548.

Root caulescent, depressed, fleshy.

Pers. Shillum.

Arab. Subjum.

Beng. Shalgum.

Is very generally cultivated in Persia, and most parts of India, during the dry season, from October until March.

2. B. *oleracea. Willd.* iii. 548.

Root caulescent, columnar, fleshy. Common cabbage.

Arab. Kermub.

Pers. Ghellum or Kellum.

Beng. and *Hind.* Kobee.

Found in a cultivated state only, probably a native of Persia and the western parts of Asia.

3. B. *erucoides.*

Leaves lyrate. *Racemes* very long. *Siliques* clavate, pressed, every part of the plant smooth.

Beng. Shwet, or Suffet shursi. Cultivated during the cool season for the seed, from which oil is procured by expression.

SINAPIS. Schreb. gen. N. 1087.

Calyx expanding. *Claws* of the corol straight. *Glands* between the shorter stamina and pistil, and between the longer and the calyx.

1. S. *dichotoma.*

Dichotomous. *Siliques* cylindric, smooth, spreading; *beak* straight and tapering. *Leaves* stem-clasping, the lower ones somewhat lyrate; the superior, ovate-lanceolate, entire, all smooth, as are also the stem and branches.

Beng. Shanchi, shurshi, or Sada Rayee.

Hind. Soorsun. III. 118

A native of Bengal, where it is cultivated by the natives, during the cold season for its seed, from which they express an oil, used by them for various purposes, chiefly to anoint their bodies with.

Root almost simple, annual. *Stem* dichotomous, round, and smooth, height of the whole plant in a good soil from two to four feet; its duration about three months, being generally sown in November, and the ripe seed gathered in February. *Leaves* stem-clasping; the *lower* ones lyrate with margins more or less scolloped, the *superior* ones entire, of an obtuse, trian-

Page Carey Ed. gular shape, with broad-cordate, stem-clasping base, all are smooth on both sides, and somewhat fleshy, from two to eight inches long. *Racemes* terminal. *Flowers* numerous, pretty large, bright yellow. *Petals* round. *Stamens* twice the length of the claws of the petals. *Siliques* spreading, almost horizontal, sub-cylindric, smooth, two-celled, from two to three inches long, with a tapering acute beak of from half an inch to an inch in length. *Seeds* small, smooth, of a light brown colour.

2. S. *glauca. R.*

Annual. *Siliques* long-pedicelled, erect, sub-cylindric, smooth, with a long, somewhat clavate beak. *Stem* and *branches* straight, smooth, glaucous. *Leaves* stem-clasping, smooth in every part; the *lower* ones lyrate, the superior ones sub-lanceolate.

Beng. Shwet Rai, white mustard.

Cultivated as a field crop in all the northern parts of India during the cold season.

Root very ramous, of three or four months duration. The seed time being November, and harvest in February.

Stem straight, with many straight scattered branches, all are round, smooth and glaucous, height of the whole plant from three to five feet. *Leaves* stem-clasping, the *lower* and *cauline* ones lyrate, with lobes sub-opposite, obtuse, and nearly triangular, the terminal one
III. nearly round and more or less scollop-toothed; the *superior* or *floral leaves* sub-lanceolate,
119 contracted at the middle, with enlarged, cordate, stem-clasping base, all are perfectly smooth on both sides, and glaucous, varying in size from one inch to a foot. *Racemes* terminal. *Pedicels* sub-erect, round, smooth, slender, nearly as long as the full grown siliques. *Flowers* numerous, of a bright yellow. *Petals* obovate, bright yellow. *Stamens*, the four nearly twice as long as the claws of the petals. *Siliques* long-pedicelled, flattened transversely, smooth, expanding. *Beak* smooth, almost as long as the silique and flattened with a roundish, thick apex. *Seed* numerous, smooth and white, like those of *Sinapis alba.*

The entire seed is used for various economical purposes, an oil is also expressed from it, which is much used in the diet of the Hindoos.

3. S. *ramosa. R.*

Annual, erect, ramous. *Siliques* expanding linear, vertically compressed, smooth. *Leaves* petioled, the *lower* ones lyrate; the *superior* ones sub-lanceolate.

Beng. Rayee.

A native of Bengal, where it is cultivated during the cold season. The seed-time being in October, and the harvest in February. The seed and the oil yielded by expression, are useful ingredients in the diet of the Hindoos.

Root annual. *Stem* erect, very ramous; *branches* expanding a little, all perfectly smooth, except now and then near the base of the plants, a few soft, white bristles are present; height of the whole plant in a good soil from four to five feet. *Leaves* petioled, the *lower* ones lyrate, in some plants somewhat scabrous, with margins variously serrate-dentate, and often somewhat lobate, towards the top of the plants they are less compound, till at last they are simply lanceolate and smooth, varying in size from an inch to a foot in length. *Petioles* of the
III. lower, or large leaves, round, slightly channelled, and sometimes armed like the bottom of the
120 stem, and large branches, with soft white bristles. *Racemes* terminal; *pedicels* expanding. *Calyx* linear, expanding. *Petals* obovate, bright yellow. *Stamens* longer than the claws of the petals. *Siliques* linear, straight, expanding, from one to two inches long, turgid at the seeds, otherwise smooth, somewhat vertically compressed; beak very short, one-sixth the length of the silique, tapering to a point. *Seed* in each cell, one row, and rather remote, round, dark brown, beautifully rugose.

4. S. *brassicata. Willd.* iii. 555.

Annual. *Radical leaves* long-petioled, obovate, almost entire; the *superior* ones stem-clasping. *Calyx* longer than the claws of the petals; the two shorter stamens nearly hid.

Chin. Pak-tsoi.

Is a native of China, from thence the seeds were procured, sent to the Botanic garden by Mr. John Miller.

Root in Bengal annual. *Stem* scarcely any, till in blossom, and then the whole plant is uncommonly ramous, and from four to six feet high in our rich soil of Bengal. *Leaves*, the *radical* ones obovate and oval, generally entire, recurved, pretty long, erect, somewhat incurved, smooth, shining, with white petioles, margins waved, sometimes a little lobate, or even lyrate toward the base, smooth on both sides; nerve and veins white like the petioles; *stem* and *floral leaves* stem-clasping, linguiform or lanceolate, obtuse, generally entire. *Inflorescence* as in the common cabbage. *Flowers* numerous, large, of a bright yellow. *Calyx; leaflets* linear, obtuse, concave, rather longer than the claws of the petals. *Stamens* the shorter pair nearly hid within the tube formed by the claws of the petals, with the apices of their anthers recurved, while the apices of the superior four are incurved over the stigma. *Style* rather shorter than the four long stamens. *Siliques* expanding, on pedicels half their length, sub-cylindric,
III. smooth; *beak* one-third their length, tapering. *Seed* round, dark brown, somewhat rugose.
121

5. *S. trilocularis. R.*

Annual, erect, ramous, smooth. *Leaves* stem-clasping, the *lower* ones deeply pinnatifid; the *superior* ones linear, and almost entire. *Siliques* smooth, pendulous, three-celled, long taper beaked; seeds white.

From Nepal, where the plant is cultivated, Dr. Buchanan sent seeds to the Botanic garden at Calcutta in 1802, where the plants thrive luxuriantly, and blossom and ripen their seeds during the cold season.

Stem annual, erect, smooth, with smooth, erect branches; whole height about three or

four feet. *Leaves*, all stem-clasping, the *lower* and *cauline* ones more or less pinnatifid; the *superior* ones linear, and nearly entire, all are somewhat bristle-dentate on the margins, otherwise smooth in every part, and somewhat glaucous. *Racemes* terminal, and axillary. *Flowers* large, erect, yellow. *Siliques* long-pedicelled; immediately after the decay of the flowers, the pedicels become perfectly recurved, and the siliques pendulous; they are all smooth, three-celled, and on that account much larger and broader than those of many other species. *Beak* long, half the length of the pods, taper. *Seeds* numerous, large, round, smooth, white. Page Carey Ed.

6. S. *cuneifolia. R.*

Annual, erect, ramous. *Leaves* petioled, obovate, cuneate, serrate-dentate, with sessile, linear, entire, floral leaves. *Siliques* expanding, smooth, short, subulate, beaked. *Seeds* roundish, chesnut coloured.

The seeds of this species Dr. Buchanan, while in Nepal, received from Thibet, and sent to this garden, where the plants thrive well during the cold season. They blossom in March, and ripen their seed in April.

Root annual, large, white and tapering, subfuciform with numerous spreading lateral fibres. *Stem* erect and smooth, with numerous sub-erect, smooth, somewhat glaucous branches; height of the plants in the Botanic garden from four to six feet. *Leaves* radical and cauline, petioled, erect, obovate, cuneate, serrate-dentate, slightly rugose, and destitute of pubescence, those about the top of the plant are sessile, linear-lanceolate, recurved, and entire. *Petioles* generally coloured, smooth, nearly round, and deeply channelled. *Racemes* terminal, erect. *Flowers* numerous, small, of a bright yellow. *Calyx* expanding, longer than the claws of the petals. *Petals* with broad claws, and obovate, spreading lamina. *Stamens*, the four larger considerably longer than the claws of the petals. *Siliques* short-peduncled, expanding, linear, obscurely four-sided; beak short and subulate. *Seeds* from ten to twenty in each cell, round oval, obscurely pitted, dark brown. III. 122

7. S. *rugosa. R.*

Annual. *Radical* and *cauline leaves* obovate, and rugose, with the *posterior* margin laciniate, and the *anterior* one dentate; nerve very broad, and dividing above the middle like the ribs of a fan; *floral leaves* linear and entire. *Siliques* expanding, torose, short, subulate, beaked. *Seeds* round, chesnut-coloured.

The seeds of this very stately species were sent from Nepal by Dr. Buchanan to this garden, where the plants grow luxuriantly during the cold season, and ripen their seed in March. Dr. Buchanan remarks that he received the seeds from Thibet.

Stem scarcely any till the plants begin to blossom, when it shoots up quickly, to four, five, or six feet in height, with an expanding, ramous branch from the axill of each leaf, all round and smooth. *Leaves*, the *radical* ones are petioled, very rugose, and disposed somewhat spirally, which disposition is particularly conspicuous while young; the *cauline leaves* are shorter petioled, or even sessile; the *posterior margins* of both the radical and cauline leaves variously and deeply jagged; the *anterior* margin dentate; the *nerve* is remarkably compressed, ribbed, and broad, armed with a few inoffensive bristles underneath, and beyond the middle divides like the radii of a fan, which alone readily distinguishes this species while young from all the other sorts I have yet met with. *Floral leaves* linear, and mostly entire. *Racemes* terminal, &c. as in the other species. *Flowers* numerous, bright yellow. *Siliques* short-peduncled, expanding, linear, obscurely four-sided, torose; *beak* short and subulate. *Seeds* from ten to twenty in both cells, small, round, dark brown, pitted. III. 123

It approaches nearer to S. *brassicata* than to any other species I am acquainted with. The young plant possesses a warm agreeable taste, and makes excellent sallad.

8. S. *erysimoides. Roxb.*

Annual, erect, with divaricating branches and branchlets. All the leaves petioled, serrate and smooth, from lyrate to pinnatifid, and lastly, linear-lanceolate. *Siliques* short, four-sided, smooth, short-beaked, adpressed to the raceme.

The seeds were sent from Wynaad, a province of Malabar, by Captain Dickinson, to the Botanic garden, where the plants thrive luxuriantly during the cold season; it blossoms in February and March, and the seed ripens soon after.

Stem annual, erect, or nearly so; *branches* and *branchlets* numerous, diverging, smooth, often deeply tinged with red, or purple; general height of the whole plant from three to four feet. *Leaves* petioled, serrate, and smooth, the larger or inferior are lyrate, with the large terminal lobe thereof deeply and variously divided, advancing upwards they become less and less cut, till at last they are simply lanceolate. *Racemes* terminal, &c. as in the other species. *Petioles* obovate, winged, length of the calyx. *Siliques* short-peduncled, linear, four-sided, torose, smooth, adpressed to the racemes, as in *Sanapis nigra; beak* short, subulate, headed. *Seeds* about eight or twelve in each cell.

9. S. *divaricata. R.* III. 124

Annual, erect, angular, with branches divaricate. *Leaves* pinnatifid, with winged petioles, embracing the stem. *Pedicels* diverging. *Calyx* as long as the corol. *Siliques* cylindric, smooth, incurved; *seeds* very numerous. *Stigma* sessile.

Beng. Bâl, or junglee rayee.

A wild species, a native of Bengal, where it appears during the hot and cold seasons, in moist cool places.

Root annual. *Stem* erect, furrowed. *Branches* several, nearly as large as the stem itself, issuing from its base, and in luxuriant plants, again furnished with several smaller ones. *Leaves* pinnatifid, with the lobes unequal, and variously dentate, and not very smooth, free from every kind of pubescence, from one to six inches long. *Petioles* winged, and at the base the

Page Carey Ed. wings are enlarged into rounded, stem-clasping lobes. *Racemes* shorter than in most other species. *Pedicels* expanding, about a quarter of an inch long, round, smooth. *Flowers* small, yellow. *Petals* cuneate, as long as the calyx only. *Stamens* longer than the corol. *Style* none. *Stigma* sessile on the germ. *Siliques* spreading much, almost diverging, cylindric, smooth, incurved, without beak. *Seeds* very small, and very numerous, brown, rough.

I do not find any use made of this plant or its seed.

10. S. *patens. R.*

Annual. *Siliques* linear, spreading, transversely compressed; *beak* short and tapering. *Leaves* from obovate-cuneate to lanceolate, serrate, smooth. *Stem* and *branches* smooth.

Beng. Keel-rayee.

The species is a common weed amongst other small, wild annual plants in gardens, cultivated fields, &c. in the vicinity of Calcutta, where it appears during the rains and blossoms in the cold season.

Root annual. *Stem* erect, short, smooth, dividing into numerous, alternate, smooth, expanding branches and branchlets; height of the whole plant from six to eighteen inches.
III. *Leaves* short-petioled, the lower ones from obovate to oblong; *margins* irregular and grossly
125 serrate; the *superior* or narrower leaves lanceolate and more acutely serrate, all smooth on both sides, from one to six or more inches long. *Racemes* terminal, many-flowered. *Flowers* small, yellow. *Siliques* expanding, linear, transversely compressed, swelled at the seed, but in other respects smooth, crowned with a short tapering, smooth beak. *Seeds* minute, round, smooth, brown.

I cannot learn that the Hindoos make any use of this plant.

11. S. *pusilla. Roxb.*

Annual, erect, ramous. *Siliques* expanding, filiform, smooth; *stigma* sessile. *Leaves* recurvate, with lobes almost entire.

Of what part of India this is a native is to me uncertain, I can only say, that it made its first appearance in the Botanic garden, where earth from the Coromandel coast had been spread; of course, I conclude it is from thence.

Root of about three months' duration. *Stem* erect, with a few sub-erect branches of nearly the same length, all round and slightly villous; height of the whole plant about a foot and a half in our rich soil of Bengal. *Leaves* scattered, petioled, between pinnatifid and lobate, with the lobes nearly entire, smooth on both sides, from two to six inches long, and from one to two broad. *Racemes* lengthening. *Flowers* minute, yellow. *Petals* cuneate, scarcely larger, or longer, than the leaflets of the calyx. *Style* scarcely any, but the germ immediately crowned with the large stigma. *Siliques* expanding, filiform, round, slightly protuberant at the seeds, somewhat villous, no beak, but crowned with the remains of the large scabrous stigma. *Seeds* oblong, compressed.

RAPHANUS. Schreb. gen. N. 1098.

Calyx closed. *Silique* torose, sub-articulate, cylindric. *Glands* one or two between each
III. shorter stamen and pistil, and two between the longer and the calyx.
126 R. *sativus. Willd.* iii. 560.

Siliques cylindric, torose, two-celled.

Sans. Mooluka.

Beng. Moola, or Moolee.

Arab. Fujl.

The sort cultivated in Bengal is a pale red variety, the root of which grows to the size of a man's leg, or more, and is only half immersed in the soil. It thrives best during the dry season.

CLEOME. Schreb. gen. N. 1099.

Calyx spreading. *Petals* ascending or regular. *Siliques* dehiscent, one-celled, two-valved.

It is impossible to fix upon any one essential character, that will include the plants of India only, hitherto assigned to this family, some are gynandrous, some polyandrous, some hexandrous, &c. with their corols as much diversified as the stamina.

1. C. *pentaphylla. Willd.* iii. 564.

Annual, erect. *Flowers* gynandrous, hexandrous. *Leaves* quinate and petioled; *floral leaves* ternate and sessile.

Cara-veela. *Rheed. Mal.* ix. *t.* 24.

Cara-vella. *Asiat. Res.* iv. 294.

Beng. Kanalla.

Teling. Wominta.

An annual plant of from one to three feet high, delighting in gardens and rich cultivated lands.

Root ramous. *Stem* erect, except when old, then bent much to one side, round, hairy, winding. *Branches* numerous, two-forked, sometimes coloured on the side most exposed. *Young shoots* more hairy, and glutinous. *Leaves* alternate, petioled, digitate. *Leaflets* sessile,
III. unequal, obovate, or broad wedge-formed, somewhat pointed, having both sides clothed with
127 short glutinous hairs, with the margins a little waved, and the size very various. *Petioles* channelled, from three to four inches long, frequently armed with small, inoffensive prickles. *Racemes* terminal, long, corymbiform, particularly while young. *Bractes* short-petioled, ternate,

numerous, surrounding at regular distances every part of the raceme, those on the lower part sterile, above one-flowered; *leaflets* of the bractes hairy, like those of the leaves, but much smaller. *Flowers* small, white, long-pedicelled, spreading. *Calyx; leaflets* lanceolate, hairy and glutinous. *Petals* erect, affixed between the leaflets of the calyx by five long claws. *Nectary* no other than a swelling at the insertions of the petals. *Stamens* six, ascending, inserted into the pedicel a little above the middle. *Pistil*, pedicel long, ascending, filiform. *Germ* linear. *Stigma* sessile, large, glandular, navelled, perforated. *Silique* long, slender, a little scabrous, diverging. *Seeds* numerous, kidney-formed, black, scabrous. Page Carey Ed.

The taste of the plant is simply herbaceous; its leaves are eaten as an esculent vegetable by the natives in their curries.

2. C. *chelidonii. Willd.* iii. 567.

Annual. *Leaves* digitate. *Calyx* and *corol* regular, polyandrous, with the top of the filaments, clavate. *Siliques* sessile.

Teling. Kax, bitter, Woominta.

One of the most common, annual plants all over the Circars, it delights in rice lands, and appears in the greatest plenty immediately after the first rains, during which time the fields are entirely covered with this gaudy elegant plant.

Stem annual, straight, ramous, round; from one to three feet high. *Leaves* alternate, petioled, digitate. *Leaflets* from five to nine, wedged, lanceolate, waved, scabrous. *Petioles* longer than the leaflets. *Racemes* terminal. *Flowers* long-pedicelled, large, rose-coloured, remote. *Bractes* single, those of the lower flowers, leaf-like, as the raceme lengthens, becoming more simple. *Calyx* four-leaved; *corol* four-petioled, nearly orbicular, concave, spreading. *Filaments* numerous (about one hundred) with enlarged apices. *Anthers* linear, recurved. *Germ* sessile, cylindric. *Style*, scarcely any. *Stigma* umbilicated. *Silique* long, slender. *Seeds* scabrous. III. 128

The seeds dried and powdered, are used in curries by the natives.

3. C. *viscosa. Willd.* iii. 566.

Annual, erect, hairy, glutinous. *Leaves* digitate; the *floral* ones ternate and sessile; *flowers* polyandrous. *Petals* unilateral.

Aria veela. *Rheed. Mal.* ix. *t.* 23.

Sinapistrum *Zeylanicum, Burm. Zeyl. p.* 2. 15. *t.* 22, although a bad figure, appears to be intended for this plant.

Beng. Hoor hooria.

Teling. Kuka-wominta.

Annual, a native of cultivated lands. It is more upright, and less ramous than the preceding species, and from one to three feet high.

Root descending, almost simple. *Stem* in old plants, smooth; the young stems, and tender branches of old ones are hairy and glutinous. *Leaves* alternate, petioled, digitate. *Leaflets* as in C. *pentaphylla*, only a little more waved round the margin. *Flowers, leaves*, or *bractes* ternate, and much smaller than the others, one-flowered. *Racemes*, if I call all those parts that are covered with the floral leaves, little else remains. *Flowers* solitary, peduncled, erect, yellow, appearing in succession, always at the extremity of the raceme only. *Calyx* spreading. *Corol* as in the family. *Nectary* no other than a large receptacle which receives the calyx, petals, stamens, and pistil. *Filaments* about twenty, ascending, shorter than the petals. *Anthers* after bursting their apices are revolute. *Germ* sessile. *Style* short. *Stigma* oblong, navelled, perforated. *Silique* erect, round, striated, hairy. *Seeds* brown, rough, round, reniform.

This species has a considerable degree of pungency in the taste, but it is not durable on the tongue.

The seeds are much used by the natives, chiefly the Brahmins, in their curries; they are sold in all our bazars, at a very trifling price. III. 129

4. C. *diffusa. Roxb.*

Diffuse, annual, hispid. *Leaves* ternate. *Flowers* axillary, solitary, regular, hexandrous. *Siliques* sessile.

A small, spreading, annual species, common on rich cultivated lands, and such as have been lately in culture; it appears and flowers during the rainy and cold seasons.

Stem annual, diffuse, ramous, about a foot long, armed with many small inoffensive prickles. *Leaves* alternate, short-petioled, terminate. *Leaflets* wedge-formed, or oblong, grandular, having the middle nerve and margins scabrous, about one half or three quarters of an inch long, and one quarter broad. *Flowers* axillary, solitary, peduncled, small, pale yellow. *Stamens* six. *Germ* sessile. *Style* short, cylindric. *Stigma* umbilicated. *Silique* tapering towards both ends. *Seeds* scabrous.

5. C. *monophylla. Willd.* iii. *p.* 571.

Annual, erect, ramous. *Leaves* simple, lanceolate, cordate, villous. *Flowers* hexandrous.

Tsjeru vela. *Rheed. Mal.* ix. *t.* 34.

Sinapistrum Zeylanicum, &c. *Burm. Zeyl. t.* 10. *f.* 2.

A native of the Coromandel coast, &c. Is in flower during the rainy and cool seasons.

Root annual. *Stem* erect, ramous. *Branches* alternate, expanding, round and villous. *Leaves* alternate, entire, soft, with short pellucid hairs; the *inferior* ones petioled, lanceolate-cordate; the *superior* ones floral, sub-sessile, and of a parabolic form. *Stipules* none. *Flowers* pedicelled, small, of a pale pink, solitary on the exterior axills, and on simple terminal racemes. *Bractes* no other than the floral leaf above-mentioned. *Calyx* of four equal, ensiform, erect, hairy, caducous leaflets. *Petals* four, arranged on the upper side, linear-oblong, obtuse, elevated on claws, nearly as long as the lamina. *Filaments* six, ascending, about as long as

130 the petals. *Anthers* blue, at first erect, afterwards spirally bent. *Germ* shorter than the filaments, sub-cylindric, hairy. *Styles* scarcely any. *Stigma* broad, somewhat rough. *Silique* long, slender, slightly incurvate, cylindric, acute, a little hairy. *Seeds* numerous, round, rugose.

CLASS XVI.

MONADELPHIA PENTANDRIA.

AEGICERAS. Schreb. gen. N. 398.

Calyx beneath five-leaved. *Corol* one-petalled, contorted. *Style* single. *Capsule* curved, without perisperm.

A. *majus. Gært. Sem.* i. *t.* 46. l. *Linn. sp. pl. ed. Willd.* i. 1082.

Leaves obovate-oblong, smooth. *Flowers* umbelled.

Beng. Hulsee.

Rhizophora corniculata. *Linn. sp. pl.* 635.

Pou Candel. *Rheed. Mal.* vi. *t.* 36. good. Rumphius's figure, if of this, is too bad to be quoted.

A small tree, a native of the Delta of the Ganges, and such other places as are overflowed at spring-tides. Flowering time, the hot season.

Leaves from alternate to nearly verticelled, short-petioled, obovate, and wedge-shaped, often emarginate, smooth, entire, firm and fleshy; two or three inches long, and from one to two broad. *Peduncles* terminal and axillary, solitary, very short, collecting round their apices in an umbel of numerous, straight, one-flowered pedicels. *Calyx* five-leaved, much contorted, permanent. *Corol* one-petalled. *Tube* short, gibbous; *mouth* woolly. *Border* five-parted; *divisions* contorted, tapering from cordate bases to short points; soon after expansion they be-
III. come reflected. *Filaments* five, coalesced into a tube round the germ, inserted into the bottom
131 of the tube of the corol, very woolly. *Anthers* long, incumbent. *Germ* ovate. *Style* longer than the stamens, tapering. *Stigma* acute. *Capsule* horn-shaped, much pointed, smooth, one-celled, one-valved. *Seed* solitary, filling the capsule.

PISTIA. Schreb. gen. N. 1112.

Calyx inferior, irregular, one-leaved, spathaceous; *tube* obliquely campanulate; *border* crowded, bearing the stamina on its centre. *Corol* none. *Germ* semi-supera, one-celled, many-seeded; *attachment* unilateral. *Style* single. *Capsules* one-celled, many-seeded. *Embryo* in the apex of the ample perisperm.

P. *stratiotes. Willd.* iii. 690.

Tala indica *Lourier. Cochin Ch.* 492.

Sans. Koombhika.

Kodda-pail. *Rheed. Mal.* xi. *t.* 32.

Plantago aquatica. *Rumph. Amb.* vi. *t.* 74.

Teling. Neeroo boodookee.

Hind. and *Beng.* Taka panna.

Found swimming on pools of stagnant water in most parts of India, having much the appearance of half-grown Lettuce plants. Flowering time the hot season, seed ripens after the rains.

Root consists of numerous, long, tapering, hairy fibres. *Leaves* radical, sessile, between obcordate and triangular; having the *exterior* margin scolloped, with many elevated ridges running lengthways underneath; downy on both sides. *Gemmation* or *stoles* from the base of the united leaves. *Flowers* short-peduncled from the centre of the leaves, few and in succession, small, pale-yellow, the structure uncommon and beautiful in the extreme. *Calyx* inferior, one-leaved, tubular, irregular. *Tube* obliquely bell-shaped, woolly on the outside; a
III. crescent-shaped, fleshy, yellow gland, or *lower nectary*, on the centre of the inside, opposite to
132 the stigma. *Border* cordate, woolly on the outside; *margins* a little waved; on its middle there is a green, fleshy, crenulate, saucer-shaped body, or *upper nectary*, from the centre of which rises the antheriferous column. *Stamina*; *filaments* single, from the centre of the upper nectary of the border of the calyx. *Anthers* five, adjoined to the enlarged apex of the short filament.

Note. This part of the fructification is in no respect situated as in the class *Gynandria*, for which reason I have removed it to *Monadelphia*. *Germ* superior, ovate, one-celled, containing many ovula attached to the interior side of the cell, which is there thick. *Style* short, slightly curved, ovate toward the stamina. *Stigma* somewhat peltate. *Capsule* beaked, one-celled. *Seeds* a few, oval, rugose, affixed to a longitudinal receptacle on the inside of the base of the capsules, which from its oblique situation appears to be its back part. *Embryo* obovate, lodged in the apex of an ample perisperm.

MODECCA. R.

Calyx tubular, coloured, five-parted. *Petals* five; inserted on the calyx. *Nectary* various. *Germ* pedicelled, one-celled; *ovula* many; *attachment* parietal. *Capsule* one-celled, three-valved. *Seeds* many. *Embryo* inferior, centrifugal, and furnished with a perisperm.

I have adopted Van Rheed's name for a generic one to this family, which though nearly allied to *Passiflora*, seems sufficiently distinct on account of its capsular seed-vessel and monoicous habit. Page Carey Ed.

1. M. *trilobata. R.*

Leaves three-lobed, with a gland under each sinus and two at the base. *Capsules* oblong.

Akund-Phul, the vernacular name in Chittagong, where the plant is found in the moist forests growing to an extent of many fathoms; ramous, and climbing up and over trees of a large size. III. 133

In the Botanic garden it grows slowly, though healthy; flowers during the rains, and the fruit ripens in October.

Bark on the old ligneous parts ash-coloured; on the young shoots smooth, polished, green. *Leaves* remote, alternate, petioled, smooth on both sides, three-lobed, with the *lobes* entire, tapering and acute. *Glands* a large yellow one under each sinus and two at the base. *Petioles* nearly as long as the leaves, columnar, smooth, base permanent, though not enlarged, as in M. *tuberosa*, and becoming a recurved, blunt, short thorn. *Tendrils*, axillary floriferous; when not floriferous, simple. *Flowers* numerous, male and female, mixed on the same tendril, middling-sized, forming a little dichotomous corymb toward the apex of the tendrils. *Calyx* tubular, somewhat gibbous towards the base; *colour* pale yellow; *mouth* five-parted. *Petals* five, linear-lanceolate, ciliate, inserted on the tube of the calyx, near the base. *Nectarial* scales, on the *male* none, on the *female* ten; five are alternate with the petals, entire, and truncated, and five under the petals smaller and ciliate. *Filaments* in the male, five united into a tube. *Anthers* linear, erect. *Germ* in the male a small three-cleft gland, in the *female* short-pedicelled, oblong, one-celled; *ovula* many, attached to three ventrical parietal receptacles. *Style* none. *Stigma* three-lobed. *Capsule* pedicelled, berried, oblong, of the size of a pullet's egg, fleshy, smooth, polished, of a scarlet colour, three-valved, opening from the apex. *Seeds* many, attached by very thick, soft, fleshy cords, to a thickened ridge, down the middle of each valve, obcordate, inversed in a completely soft lucid aril. *Integuments* two; the *exterior* one nuciform, dark-coloured, scrobiculate; the *interior* one membranaceous. *Perisperm* conform to the seed, somewhat glaucous. *Embryo* nearly as large as the perisperm, with round, three-nerved cotyledons, and the radicle lodged at the umbilicus of the seed. III. 134

2. M. *tuberosa. R.*

Leaves three, rarely five-lobed; *lobes* sub-lanceolar, apex of the petioles with two glands and one (or an eye) under each sinus. *Capsules* globular.

Modecca. *Rheed. Mal.* viii. *t.* 20.

A most extensive, perennial, climbing plant, with large, fusiform root, a considerable portion of which is above ground, tapering from the surface of the earth, into the stem, which in a few years becomes ligneous; *younger shoots* cylindric and smooth. From Cochin it was introduced by Mr. M. Brown into the Botanic garden at Calcutta, where it blossoms during the rainy season.

Leaves alternate, petioled, when the plants are very young simply cordate, often from three to five-lobed (palmate,) but three is by far the most common; *lobes* entire, sub-lanceolate, smooth, rather acuminate; general size from six to eight inches each way. *Glands*, a large yellow one under each sinus and two on the base where it joins the petiole. *Petioles* considerably shorter than the leaves; *base* enlarged into a horn-shaped process on each side, this portion is permanent. *Stipules* none. *Tendrils* springing from the inside of the large permanent base of the petioles, when not floriferous, simple. *Flowers* pretty large, short-pedicelled, and generally from a small dichotomous corymb on the middle of the tendril. *Calyx* one-leaved, coloured, greenish yellow, of a short, sub-campanulate form, with a short five-parted border. *Petals* five, linear; the *upper half* ciliate, inserted on the tube of the calyx, near its bottom, the whole hid within it. *Nectarial scales* five, alternate with the petals, vaulted, and serving to confine the five anthers. *Filaments* five, their base united into a ring round the base of the pelicel of the germ, and about as long as its pedicels, recurved. *Anthers* small, roundish. I suspect there are male flowers which I have not yet seen, with more perfect anthers. *Germ* superior, short-pedicelled, oval, one-celled; *ovula* numerous, attached to three vertical, parietal receptacles. *Styles* three, recurved. *Stigmas* large, globular. *Capsule* pedicelled, globular, fleshy even when ripe, of a bright glossy yellow, and the size of a crab-apple, one-celled, three-valved, open from the apex. *Seeds* many, attached as in the germ, by short cords, obliquely cordate. *Aril* a laciniate, white membrane, round the base only. III. 135

3. M. *dubia. R.*

Leaves ovate-oblong, entire, or slightly sub-lobate; two glands at the base.

A native of Sumatra, from thence introduced by Dr. C. Campbell, into the Botanic garden at Calcutta, where one male plant blossomed in February 1808.

Stem and *branches* shrubby, climbing to an extent of some fathoms. *Bark* of the ligneous plants ash-coloured; that of the young shoots smooth and green. *Leaves* alternate, petioled, oblong, obtuse-pointed; some of them slightly three-lobed toward the apex, smooth on both sides, having at the base a large yellow gland on each side, from three to four inches long, and from one and a half to two inches broad. *Petioles* axillary, about an inch long, channelled. *Tendrils* axillary, simple, with two lateral lobes; at the season of flowering, these lobes lengthen into stout, one-flowered peduncles. *Flowers* axillary, pedicelled, small, of a pale greenish yellow, three together on a very short common peduncle, or in pairs from the just mentioned lobes of the tendrils. *Calyx* one-leaved. *Tube* gibbous; *mouth* five-cleft. *Segments* oblong, revolute. *Petals* five, inserted into the calyx, a little below the sinuses of its border, lanceolate, and with the segments of the calyx becoming revolute. *Filaments* five,

Page Carey Ed. very short, inserted on a small receptacle in the bottom of the calyx. *Anthers* sagittate. *Ger* none, a slender, sub-rotate body, with a two or three-cleft apex in the centre of the stami is all that presents itself.

III. 136

MONADELPHIA HEXANDRIA.

CANARIUM. Schreb. gen. N. 1516.

Calyx inferior, three-toothed. *Petals* three. *Germ* superior, three-celled, with two ovul in each; *attachment* sub-superior. *Drupe*, with as far as three one-seeded cells. *Embryo* i verse, without perisperm.

1. C. *bengalense. R.*

Leaflets ovate, lanceolate, from six to ten pairs. *Stipules* subulate. *Panicles* sub-axillary linear. *Drupe* ovate.

An immense forest tree, a native of Silhet and the adjoining mountainous countries nort and east of that district; flowers in May and June, and the seed ripens about the beginnin of the year. From fissures, or wounds in the bark, a large quantity of a very pure, clear, am ber-coloured resin exudes, which soon becomes hard and brittle, and is not unlike *copal*, ye the natives set little or no value on it. It has hitherto, so far as I can learn, been unnotice by any one else. In the Calcutta bazar, it is only valued at from two to three Rupees, fo seven maunds of eighty pounds weight each.

Trunk erect, straight, many feet in circumference, the whole tree tall, and uncommonly well furnished. *Young shoots* void of pubescence, except the thin, tender, shooting points and they are covered with a little rust-coloured, pubescence. *Leaves* alternate, round th ends of the branchlets, unequally pinnate, from twelve to twenty-four inches long. *Leaflet* sub-opposite, from six to ten pairs, from ovate-oblong to lanceolate, firm, entire and smooth acuminate, from three to six inches long, by from one to two broad; *common petioles* round and smooth. *Stipules* subulate, clothed with long soft ferruginous down. *Racemes* solitary, insertion above the axills, sub-panicled, shorter, in flower and fruit all the year round. *Flowers*

III. 137 rather small, but numerous, many of them abortive, male hermaphrodites. *Calyx* inferior, cup-shaped, three-toothed. *Petals* three, obovate-oblong, smooth, while in the bud imbricated. *Nectary*, a three-lobed, hairy cup round the lower part of the germ, and within the tube, formed by the filaments. *Filaments* six, united into a tube for half their length. *Anthers* oblong, erect. *Germ* superior, ovate, small, three-celled, with two ovula in each attached to the top of the axis. *Style* short. *Stigma* three-cleft. *Drupe* oblong, size of a large olive, smooth, one-celled. *Pulp* in considerable quantity, firm and yellowish; surface dark purple, covered with bloom like the common plum. *Nut* conform to the drupe, pointed, obscurely three-cornered, with an aril from the apex to the base, runs down each of the three sides or faces, thick and very hard, three-celled, &c. almost exactly as in Gærtner's *Canarium sylvestre*, ii. *p.* 98. *t.* 102. except in the ribs on the three sides, not represented in his figure. *Seed* one, rarely two, in each cell, oblong. *Integument* single, rather spongy and brown. *Perisperm* none. *Embryo* inverse. *Cotyledons* intricately folded up as represented by Gærtner. *Radicle* superior, oblong.

2. C. *commune. Willd.* iv. 759. *Annals of Botany*, i. 360. *t.* 7. *f.* 2.

Leaflets from seven to nine, long-petioled, ovate-oblong, smooth, entire. *Stipules* oval, permanent. *Panicles* terminal.

Canarium vulgare. *Rumph. Amb.* ii. *t.* 47.

A native of the Moluccas, from thence brought to the Botanic garden at Calcutta, but does not thrive, the winters being too cold for it, for in fourteen years the plants are not more than ten feet high, with but five branches, and have not yet blossomed.

3. C. *sylvestre. Willd.* iv. 760.

III. 138 *Leaflets* from seven to nine, short-petioled, from ovate-oblong to ovate-lanceolate, smooth, entire, acuminate. *Stipules* petiolary, sub-orbicular; *petioles* beyond the stipules columnar, below them channelled.

Pimela nigra. *Lour. Cochin Ch.* 495. See *Rumph. Amb.* 155. *t.* 49.

Canarium *Pimela. Annals of Botany*, i. *p.* 361.

In its native soil, the Molucca Islands, it grows to be a large handsome tree. In the Botanic garden at Calcutta, where it has been for fourteen years, it is not more than ten or twelve feet high, with a distinct, straight trunk, covered with smooth, ash-coloured bark, the *crown* or *corona* regular, ample and very leafy. The *stipules* clearly mark this species. They are opposite and inserted on the common petiole, nearly an inch above its base; when they fall, they leave two permanent, glandular marks behind.

4. C. *nigrum. R.*

Leaflets generally oblong, pointed, somewhat hairy. *Stipules* scarcely any. *Male flowers* on axillary, compound racemes.

Dulcamara nigra. Rumph. Amb. ii. 162. *t.* 52. and 53.

Small trees in the Botanic garden brought from Amboyna, began in the month of May to produce male flowers, when they were ten years old:

5. C. *strictum.*

Leaves hairy, *leaflets* from nine to fifteen, petioled, sub-opposite, from ovate to ovate-lanceolate, acuminate, afterwards serrulate-ciliate. *Stipules* subulate.

A native of Tinevelly, from thence introduced into the Botanic garden at Calcutta, where the young trees from the seeds are twenty or twenty-five feet high, straight, and without a

single branch. The trunk tapers like a fishing-rod but is stout, and covered with ash-coloured bark, while the tender parts are densely clothed with ferruginous, short pubescence. The *leaves* from three to four feet long, and the leaflets about a foot by six inches broad. They are also hairy, particularly while young.

MONADELPHIA DECANDRIA.

MELOCHIA. Schreb. gen. N. 1110.

Calyx somewhat double. *Petals* five, spreading. *Filaments* subulate. *Styles* five. *Capsules* five-celled, with a single seed in each.

1. M. *corchorifolia. Willd.* iii. 604.

M. *corchorifolia. Dill. Elth. t.* 176. *f.* 217.

Beng. Tiki-okra.

Tsjeru uren. *Rheed. Mal.* ix. *t.* 73. bad.

Perennial, ramous. *Leaves* sub-cordate, plaited, crenulate. *Flowers* crowded into subsessile, terminal heads, intermixed with subulate bractes.

Common every where all over India. Flowers and ripens its seed during the rainy and cold seasons.

CONNARUS. Schreb. gen. N. 1116.

Calyx five-parted. *Corol* five-petalled. *Style* single. *Germ* one-celled, from one to two-seeded; *attachment* sub-inferior. *Capsule* superior, one-celled, two-valved, one-seeded. *Embryo* inverse, without perisperm.

1. C. *paniculatus. R.*

Arboreous. *Leaves* pinnate; *leaflets* five or seven, ovate, oblong, obtusely acuminate, glossy. *Panicles* terminal and axillary; *flowers* decandrous; *petals* linear (without bristles at the base.)

A large timber tree, a native of Chittagong, where it blossoms in June. III. 140

Young shoots clothed with a little ferruginous down. *Leaves* alternate, unequally-pinnate, about twelve inches long. *Leaflets* five or seven, rarely three, the pairs sub-opposite, ovate-oblong, entire, obtuse-pointed; smooth and glossy, from three to six inches long, and from one to two broad. *Petioles* round and smooth. *Panicles* terminal, and generally a smaller one in many of the exterior axills, large, diffuse, and clothed with rust-coloured pubescence. *Bractes* small, caducous, villous, like the rest of the panicle. *Calyx* five-leaved; *leaflets* oblong, concave. *Petals* five, alternate with the leaflets of the calyx, and larger, linearly-lanceolar, yellow, entire, nothing like a bristle or hair from any part, hence I conclude it cannot be Willdenow's C. *pinnatus*. *Filaments* ten, united at the base, alternately as long as the style. *Anthers* cordate. *Germ* superior, conical, hairy, one-celled, containing two ovula, attached a little to one side of the bottom of the cell. *Style* hairy, of the length of the five longest filaments. *Stigma* somewhat headed.

2. *pentandrus. R.*

Leaves pinnate; *leaflets* from three to seven, oblong, obtusely acuminate, polished. *Panicle* terminal. *Flowers* pentandrous. *Capsules* polished, obliquely oblong, obtuse.

Hind. Moolseree; Toog, about Silhet, where the tree is indigenous; blossoms during the hot season, and the seeds ripen in September.

MONADELPHIA DODECANDRIA.

KLEINHOVEA. Schreb. gen. N. 827.

Calyx five-leaved. *Corol* five-petalled, irregular. *Column* of the fructification, clavate. *Staminiferous tube* five-cleft, each division supporting about three anthers. *Germ* superior, five-celled; *cells* few-seeded; *attachment* interior. *Capsule* superior, inflated, five-celled. *Seed* solitary. *Embryo* sub-erect, with a scanty perisperm. III. 141

K. *hospita. Willd.* ii. 871.

Batti-marus. *Rumph. Amb.* iii. *p.* 177. *f.* 113.

This tree was introduced into the Botanic garden from the Moluccas, in 1798. In ten years, they have grown to be trees of a large size, and blossom in September.

Trunk very straight. *Bark* smooth, ash-coloured. *Branches* numerous, spreading in every direction. The wood is white and soft. *Leaves* alternate, petioled, broad-cordate, from three to five-nerved, entire, acuminate, of a very thin texture and smooth on both sides, from six to twelve inches long. *Petioles* nearly as long as the leaves, round, smooth. *Stipules* ensiform. *Panicles* terminal, roundish, ovate, large, and very ramous. *Bractes* ensiform, numerous, involucre-like, at the divisions of the panicles. *Flowers* very numerous, pretty large, of a pale, but lively rose-colour. *Calyx* five-leaved; *leaflets* lanceolate, villous, nearly equal, almost twice the length of the corol. *Petals* five, unequal. The upper one incumbent, sub-cylindric, perforated lengthways. The next pair oblong, concave, pressing on the column of fructification laterally. Lower pair also oblong, but expanding more; all are inserted into the base of the column. *Nectary*, a five-lobed ring round the base of the receptacle just within the insertion of the petals. *Filaments* five, broad, fleshy, inserted on the apex of the column round the germ, each slightly three-parted; a slender, short, sterile filament, between each of the large three-

Page Carey Ed. cleft ones. *Anthers* fifteen pairs, one on each division of the five filaments. *Germ* superior ovate, hairy, inserted on the apex of the declined, clavate column, which is rather longer than the petals. *Style* longer than the stamens. *Stigma* of five acute points. *Capsule* inflated, membranaceous, turbinate, five-lobed, five-celled, five-valved. *Seed* a single, small, round, tubercled one in each cell, attached to the middle of the inner margin of the partitions, obovate, III. somewhat tubercled. *Integuments* two. *Perisperm* thin, of a firm, tough, fleshy texture and 142 pearl gray colour. *Embryo* conform to the seed, curved, pale yellow. *Cotyledons* chrysoloide contorted, triplicate. *Radicle* inferior, curved, with its apex immediately to the umbilicus. In fact it is a *Malvaceæ*, but with a real perisperm.

HERITIERA. Hort. Kew. iii. 546.

Hermaphrodite and *male* flowers on the same individual. Hermaphrodite. *Calyx* campanulate, five-toothed. *Corol* none. *Stamens* five pairs. *Germs* five, one-celled, one-seeded; *attachment* interior. *Drupes* from one to five, keel-winged, one-seeded. *Embryo* centripetal, no perisperm.

1. H. *minor. R.*

Leaves broad-lanceolate, cinereous underneath. *Drupes* obovate, flattened, inside furrowed, outside keel-winged.

Balanopteris minor. Gært. Sem. ii. *t.* 98. *f.* 2.

Heritiera fomes. *Buch. in Symes' Ava. Willd.* v. 372.

Atunus littoria. *Rumph. Amb.* iii. *t.* 63.

Hind. and *Beng.* Shoondree, or Sundra.

Samandara. *Linn. Flor. Zeyl.* 433.

A native of the lower parts of the Delta of the Ganges, where it grows to be a large tree. Flowering time the hot season.

Trunk straight, often deeply sulcated. *Bark* slightly cracked. *Leaves* alternate, short-petioled, oblong-lanceolar, entire, smooth, of a deep green above, cinereous underneath, from four to six inches long. *Panicles* axillary, shorter than the leaves, crowded, rust-coloured. *Flowers* numerous, small, of a dull orange colour.

2. H. *littoralis. Willd.* vi. 972.

Leaves oblong. *Drupes* oval, inside keeled, outside winged.

Balanopteris Tothila. *Gært. Sem.* ii. *t.* 99.

Nagam. *Rheed. Mal.* vi. *t.* 21.

A native of Malabar, Mauritius, &c.

III. 143

HELICTERES. Schreb. gen. N. 734.

Calyx tubular, five-toothed. *Corol* of five unequal petals. *Column* of fructification clavate. *Capsules* five, leguminous, often twisted, one-celled, one-valved. *Seeds* many.

1. H. *Isora. Willd.* iii. 721.

Arboreous. *Leaves* bifarious, cuneate, obovate, sub-lobate, serrate, tomentose. *Capsules* twisted, fine-pointed.

Isora (rather *Iswara*) Murri. *Rheed. Mal.* iv. *t.* 30.

Ki-walla-nara of the Malabars of Wynaad.

This small thinly branched tree is very common in most forests over India, where it blossoms during the rains and cold season.

Leaves alternate, bifarious, short-petioled, cuneate-obovate, acuminate, from three to five-nerved, serrate; towards the apex generally somewhat lobate, very downy. *Stipules* subulate, hairy. *Flowers* axillary, several, viz. from four to eight together, generally two or three on a common peduncle, with proper pedicels, rather longer than the peduncles. *Bractes* small, hairy, subulate. *Calyx* one-leaved, hairy; *tube* somewhat gibbous, laterally compressed; *mouth* bilabiate; the *upper lip* emarginate, the *under* one three-toothed. *Corol* five-petalled, all have long, taper claws, which at the mouth of the calyx enlarge into wings, and there embrace the pedicel or receptacle of the nectary, stamina and pistillum. *Lamina* linguiform, with their apices retuse. The upper three are only about one third the breadth of the lower two. When, they first expand, the colour is a pretty bright red, but gradually becomes paler, and are nearly lead-coloured by the second day. *Nectary*, or abortive filaments, five emarginate *scales* within the staminiferous tube, and inserted into its base. *Filaments* ten, short, half-way up united into a tube round the germ. *Anthers* ovate. *Pistil; receptacles* at the base, filiform; above III. the calyx and cord clavate; at the apex enlarged and curved up, at nearly right angles. *Germ* 144 conical, five-lobed. *Style* single, twice the length of the stamina, at the base five-grooved, curved. *Stigma* simple, acute. *Capsules* five, much twisted, fine-pointed, villous, one-celled, one-valved. *Seeds* numerous, in one row, angular.

STERCULIA. Schreb. gen. N. 828.

Monœcous or polygamous. *Calyx* inferior, five-parted. *Corol* none. *Column* of fructification and *staminiferous tube*, various. *Germs* five, one-celled, many-seeded; *attachment* interior. *Capsules* leguminous, from one to five, distinct. *Seeds* few. *Embryo* various, with or without perisperm.

1. S. *Balanghas. Willd.* ii. 872.

Leaves oblong, entire, smooth. *Panicles* pendulous. *Follicles* oval, villous.

Chin. Pim-pho.

Cavalum. *Rheed. Mal.* ii. *t.* 49. Page Carey Ed.

Found in gardens about Calcutta, where it grows to be a pretty large tree, with a very ramous head.

Bark brown, pretty smooth. Flowering time April; *seed* ripens in July. *Leaves* alternate, about the extremities of the branchlets petioled, oblong, smooth on both sides, entire, from two to twelve inches long. *Petioles* round, thick at each end, about one inch long. *Stipules* none. *Panicles* axillary, generally solitary, pendulous. *Peduncles* and *pedicels* coloured, slender, a little downy. *Flowers* numerous, small, pendulous, flesh-coloured, faintly fragrant.

Male. *Calyx* or *corol*, for there is but one, one-leaved, a little hairy, campanulate, five-parted; *divisions* long, slender; *margins* revolute, converging at the points, gaping wide at the sides. *Filaments* (column) single, from the bottom of the bell of the corol, towards the apex recurved, crowded with anthers, too crowded and minute to be distinctly counted. *Hermaphrodite flowers* few, and on the same plant. *Calyx* or *corol* as in the male. *Filaments* many, III. but very short. *Anthers* perfect, surrounding the base of the germ. *Germs* five, very hairy, 145 elevated on a receptacle, surrounding a column, which ends in a style, so much recurved as to bring the five-lobed stigma in contact with the stamens that surround the base of the germ. *Capsules*, from one to five come to maturity, oval, one-celled, one-valved, opening longitudinally on the inside. *Seeds* few, affixed to the gaping sutures. *Integuments* two. The *exterior* one of a dark-chesnut colour, and clammy on the outside, on the inside buff-colour. The *interior* one coriaceous, dull black on the outside, and lined with a light brown tunic within. *Perisperm* none, except a fleshy darker coloured exterior coat of the cotyledons can be so called. *Embryo* the size and shape of the seed. *Cotyledons* thick, of different sizes and shapes. *Radicle* opposite to the umbilicus.

Note. The seeds are deemed wholesome, and nearly as palatable as chesnuts when roasted.

2. S. *urens. Willd.* ii. 873. *Roxb. Corom. pl. N.* 24.

Leaves round-cordate, five-lobed; *lobes* entire, long, fine-pointed. *Panicles* erect; *calyx* campanulate. *Capsules* armed with sharp bristles.

Hind. Bulee.

Teling. Kavalee.

A large tree, a native of the mountainous countries on the coast of Coromandel, Hindoostan, &c.

Leaves deciduous about the end of the wet season. It flowers during the cold, and the leaves appear with the fruit about the beginning of the hot season. *Trunk* erect, very straight, top large and shady. *Bark* light ash-coloured, very smooth; its outer coat is thin, transparent, covered with a farinaceous substance, and peels off like the exterior pellicle of the birch bark; inwardly it is fibrous, and netted. *Leaves* about the extremities of the branches, alternate, petioled, five-lobed, five-nerved; *lobes* acute, very downy, from nine to twelve inches each way. *Petioles* nearly as long as the leaves, round, downy. *Panicles* terminal, III. pretty large, every part covered with a glutinous, farinaceous, yellow down. *Bractes* lanceo- 146 late. *Flowers* small, numerous, yellow, male and hermaphrodite mixed; there is but a small proportion of the latter. *Hermaphrodite calyx* below, campanulate, five-toothed, leathery; *divisions* acute; on the inside of each division near the base, there is an obcordate hairy gland. *Corol* none. *Filaments* ten, alternately longer, united below into a thin sheath, which girds the receptacle of the germs. *Anthers* large, two-lobed, alternately larger. *Germs* five, placed on a thick, short pedicel, as in *Grewia*. *Style* single, short, thick. *Stigma* five-lobed. *Capsules* five, united in the form of a star, one-celled, one-valved, opening lengthways on the inside, covered with yellow down, and many stiff burning hairs. *Seeds* from three to six, oblong, chesnut-coloured, inserted alternately into the margins of the capsules.

Male. *Calyx; stamens and columnar receptacle* as in the *hermaphrodite*. *Pistillum*, the rudiments of the genus only, without any appearance of a style.

The wood of this tree is soft and spongy, except towards the centre of large trees, where it is reddish. I do not know of any use it is put to, except to make fuel.

I observed, that the water in which I kept the green branches for examination, became thick, like a clean glutinous jelly. *Bark* exceeding astringent, tinges the spittle reddish.

Note. This agrees nearly with *Sterculia plantanifolia* of the supplement. The chief difference is, that here the leaves are downy, there very smooth. It yields a gum not unlike *Tragacanth*, and has been sent to London as such, but the artists, who use that gum, did not find it answer. The seeds are roasted and used by the natives as an article of diet, and also as a dainty.

3. S. *colorata. Willd.* ii. 873. *R. Corom. pl.* i. *N.* 25. III.

Leaves five-lobed; *lobes* acute. *Calyces* club-funnel-shaped, *mouth* five-toothed. *Folli-* 147 *cles* smooth, two-seeded, opening long before the seeds are ripe.

Teling. Karaka.

A large tree, a native of the mountainous parts of Rajamundree Circar.

Leaves deciduous during the cold season. It flowers in April, soon after the leaves make their appearance, and the seed ripens about the beginning of the rains. *Trunk* erect, growing to a very great size. *Bark* ash-coloured, and a little scabrous. *Branches* numerous, spreading, their bark smoother than on the trunk. *Leaves* alternate, about the extremities of the branchlets, petioled, considerably broader than long, villous, five-lobed, five-nerved; *lobes* acute, soft; the leaves are generally, when full-grown, from nine to twelve inches broad and from six to nine long. *Petioles* round, a little downy; about nine inches long. *Stipules* erect, lanceolate, inserted into the petiole near its base. *Panicles* terminal, small, numerous, red like corol, be-

Page Carey Ed. ing covered with much red, stellate pubescence, when in flower the whole tree appears as if covered with numerous ramifications of red corol. *Flowers* numerous, about an inch long. *Calyx* one-leaved. *Tube* clavate, leathery; *mouth* five-toothed, outside covered with red stellate hairs, withering. *Corol* none. *Filaments* scarcely any. *Anthers* about thirty, kidney-formed, sessile round the border of the extremity of the receptacle, cylindric, a little curved, of the length of the calyx, round and smooth, bearing five oval germs on the top, surrounded by the stamina. *Styles* five, short, recurved. *Stigmas* acute. *Capsules*, from one to five come to maturity, pedicelled, pendulous, leathery, smooth, opening on the inside, long before the seeds are ripe. *Seeds*, generally two, adhering one to each margin of the gaping follicle, alternate, about the size and shape of a small field bean.

III. 148 4. S. *parviflora. R.*

Leaves cordate-oblong, acuminate. *Panicles* lateral, diverging. *Tube* of the calyx gibbous, with the apices of its segments united, and the sides gaping.

Hind. Ram-julparee.

A middling sized tree, a native of the hills east of Tippera. In flower in March.

5. S. *angustifolia. R.*

Leaves lanceolate. *Panicles* lateral, pendulous. *Flowers* globular; segments of the calyx united at the top, gaping at the side.

A middling sized tree, a native of Nepal. It flowers in the Botanic garden in March, when the new foliage begins to appear, the former year's having fallen during the cool season, indeed all the *Sterculias* are deciduous in Bengal.

6. S. *populnifolia. R.*

Leaves long-petioled, round, reniform, cordate, acuminate, entire, smooth, from five to seven-nerved.

A tree, a native of Coromandel. The bark is particularly smooth in our young trees.

7. S. *guttata. R.*

Leaves oblong, entire, villous underneath. *Racemes* terminal, and from the fork of the branches, simple.

Ramena-pou-maram. *Rheed. Mal.* iv. *t.* 61.

A native of Malabar, from Wynaad Captain Dickenson sent the seeds to the Botanic garden in 1802, and the young trees reared therefrom, blossomed for the first time in December 1809. They were then about twenty feet high, and the trunk twenty-one inches in circumference, four feet above the ground.

Trunk straight to the top of the trees. *Bark* considerably cracked, and no doubt in old trees much so; that of the young parts smooth, ash-coloured; *young shoots* clothed with stellate down, inwardly it abounds with very strong, white, flaxen fibres, of which the inhabitants of Wynaad manufacture a kind of coarse cloth.* *Petioles* round, downy, from two to three inches long. *Stipules* ensiform, caducous at an early period. *Racemes* terminal, and from the divisions of the branchlets, diverging, simple, clothed with ferruginous stellate pubescence. *Flowers* tern, short-pedicelled, middling sized, inodorous, by far the greater part hermaphrodite. *Bractes* lanceolar, a larger one below the middle flower of the three, and a minute one under each of the other two. *Calyx* nearly rotate, with its five segments revolute, both sides very pubescent; the outer side pale yellow; the inner one beautifully marked with numerous, minute, purple glands on a yellow ground. *Anthers* about a dozen, inserted on the border of the thin nectarial belt which embraces the base of the germ. *Germs* long-pedicelled, globose, from three to five-lobed; three most frequent, downy, from three to five-celled; each cell contains two vertical rows of ovula, attached to the inner angle of the cell. Many of the flowers are abortive, or male-hermaphrodite. *Style*, in the fertile hermaphrodite, retrofracted, nearly as long as the germs; in the male-hermaphrodite scarcely any. *Stigma* from three to five-lobed.

III 149

III. 150 *Capsules* from one to five, nearly round, of the size of a small apple, one-celled, one-valved, with the surface furrowed, orange-coloured, lined on the inside with a firm, smooth, fibrous, pink-coloured parchment-like membrane; the margins of the opening, and pedicels of the seed very hairy. *Seeds* few, oblong, of the size of a field bean. *Integuments* three; the *exterior* one thin, black and brittle; the *second* thin, light brown and tough; between these two is a soft, white, sebaceous substance; the *inner* integument is membranaceous. *Perisperm* on each side of the embryo amygdaline. *Embryo* straight. *Cotyledons* elliptic, extending completely through the perisperm. *Radicle* small, lodged in the apex of the seed opposite to the umbilicus.

8. S. *lanceæfolia. R.*

Leaves lanceolate, entire, smooth. *Racemes* axillary, simple, much shorter than the leaves; *flowers* red, long-pedicelled. *Capsules* oblong, villous, from four to eight-seeded.

Ushlea the vernacular name in Silhet, where it is indigenous, growing to be a middling sized tree. Flowering in March and April, and the seed ripening in May and June.

Bark of the trunk and larger branches ash-coloured; *young shoots* slightly villous, I may say smooth, as the little pubescence they have, when very tender, soon rubs off; thus it is

* "The bark of this tree, the Malabars convert into a flaxy substance, of which the natives of the lower coasts of Wynaad contrive to make a sort of clothing. It derives its name from the first process of its manufacture, *viz.* the chopping the bark into small pieces, *aurayoonoo*, to cut. It is not customary to manufacture the bark until the tenth year, when its size will be equal to that of most forest trees. The mode of obtaining this flaxy substance is as follows. The tree is felled, the branches lopped off, and the trunk cut into pieces of six feet long, a perpendicular incision made in each piece; the bark opened, and taken off whole, chopped, washed, and dried in sun. By these means, and without any further process, it is fit for the purpose of clothing."

For the above account we are obliged to Captain Dickenson, of the Bombay Military establishment.

also with the leaves. *Leaves* alternate, petioled, lanceolate, rather obtusely acuminate, entire, smooth, from four to eight inches long, by from one to three broad. *Petioles* about an inch long, thick at both ends. *Stipules* thick, subulate, a little hairy, caducous. *Racemes* axillary, or under the leaves, and much shorter than them, simple, erect. *Flowers* few, small, red, long-pedicelled, by far the greater part are male. *Calyx, stamina* and *pistillum* as in the genus. *Capsules* follicular; from one to five come to maturity, they are oblong, rather obtuse; the surface rather harsh with very minute, short hairs; length about three inches. *Seeds* from four to eight, oval. *Integuments* three; the *exterior* one thin, brittle, polished, black; the *second* thin, brown; between it and the exterior one a firm, dull-coloured, soft, sebaceous lamina; the *interior* integument membranaceous, light brown. *Perisperm* in rather small quantity. *Embryo* straight, of a pale yellow. *Cotyledons* oval, nearly the size of the perisperm, thick and fleshy. *Radicle* ovate, pointing to the apex of the seed, directly opposite to the umbilicus. Page Carey Ed. III. 151

9. S. *coccinea. R.*

Leaves lanceolar, entire, smooth. *Panicles* axillary, drooping; *segments* of the calyx expanded, filiform and woolly. *Capsules* oblong, beaked, from four to eight-seeded.

A small tree, a native of Silhet where it blossoms during the hot season, and the seed ripens in May and June. It is conspicuous on account of the spreading, slender, woolly segments of the border of the calyx, and the crimson capsules.

Young shoots a little hairy. *Leaves* alternate, petioled, lanceolar, with a rather abrupt base, entire, obtusely acuminate, with a few depressed, stellate, harsh hairs underneath, from four to eight inches long, and from one to three broad. *Petioles* about an inch long, and hairy. *Stipules* subulate, hairy. *Panicles* axillary, and under the leaves, solitary, the length of the leaves, but pendulous; while scarcely expanded, a little hairy. *Flowers* rather long-pedicelled, pretty large, by far the greatest part male, of a greenish yellow colour, tinged with pink. *Bractes* subulate. *Calyx* rather flat; *segments* of the border five, long, slender, and woolly, spreading out in various directions, not converging, with their lips united, as in *Balanghas parviflora,* and *angustifolia,* which also have long slender segments. *Stamina* and *pistillum* as in the other species already described. *Capsules* follicular, from one to five come to maturity, linear-oblong, ending in a sub-cylindric, obtuse, curved beak, villous, both the inner and exterior surfaces of a bright crimson; general length from three to four inches. *Seeds* from four to eight, oval, smooth, of a bright chesnut colour. *Perisperm* in small quantity, and quite divided by the cotyledons. *Embryo* straight. *Radicle* in the apex of the seed directly opposite to the umbilicus. III. 152

10. S. *alata. Roxb.*

Leaves cordate, entire, from three to five-nerved. *Racemes* crowded about the ends of the branchlets, length of the petioles. *Follicles* sub-rotund. *Seeds* numerous, winged.

A native of the countries immediately east of Bengal, where it grows to be a large, handsome, very ramous tree. Flowering time, in the Botanic garden, February and March, and the seed ripens about the close of the year. In the province of Chittagong, the tree is called *Buddha Narikella,* which may be translated, *Boodh's Coco-nut, Narikella* being one of the Sanscrit names of the *Coco-nut.* In Silhet it is called *Toola,* and there the seeds are said to be eaten by the natives as a cheap substitute for opium.

Trunk, in trees twenty-five years old, now growing in the Botanic garden, straight, tall, four feet above the ground, three and a half feet in circumference. *Bark* quite smooth, and ash-coloured. *Branches* numerous, towards the *top* of the tree ascending, *below* divaricate. In its native soil, they arrive at a much greater size; viz. ten feet in circumference, and above one hundred high. *Leaves* alternate about the ends of the branchlets, petioled, cordate, entire, smooth, from three to five-nerved, from four to twelve inches long, and from three to eight broad. Deciduous about the time the blossoms appear in February and March. *Petioles* round, smooth, from one to four inches long. *Stipules* minute, subulate, caducous at a very early period. *Racemes* axillary, sometimes terminal, thin, sub-panicled, but the most common mode is racemes in pairs from the axills of the former years toward the ends of the branchlets, and about as long as the petioles, or more densely clothed with ferruginous stellate pubescence. *Flowers* pretty large, short-pedicelled, reflex; male and female on the same racemes. *Bractes* ensiform, three under each flower, and caducous at a very early period. *Calyx* campanulate, divided nearly to the base, into five thick, fleshy, recurved, lanceolar segments; outside clothed with ferruginous, stellate pubescence; inside elegantly striated with crimson and yellow. *Corol* none. III. 153

Male Flowers. *Column* of the abortive stamina cylindric, much shorter than the calyx, straight. *Filaments* scarcely any. *Anthers* imbricated in five fascicles of about five each, which unite below the middle and form a cup round the five imperfect germs.

Female Hermaphrodite Flowers. *Column* none. *Stamina,* five sessile bundles of imperfect anthers embracing the five grooves of the base of the germs. *Germs* five, singly semi-ovate, one-celled, with two rows of ovula in each, vertically attached to the inner angle of the cell. *Styles* short, recurved, villous. *Stigmas* rather broad and emarginate. *Follicles* or rather *leguminous capsules* from one to five, from the size of a man's fist, to that of an infant's head, nearly round, long-peduncled, one-celled, one-valved; *valve* thick, tough, and very fibrous; *surface* densely clothed with a brownish olive, mealy pubescence. *Seeds* many, attached to the margins of the valve, oblong, considerably compressed, each terminated by a long, broad, spongy wing, (hence the specific name,) which becomes thin and sub-membranaceous at the [illegible]. *Integuments* three; the *exterior* one, a brown, friable, spongy body with a few fibres from the wing; the *middle* or *second* one forms an oval membranaceous envelope for the embryo only.

Page Carey Ed. and seems composed of three parts; the exterior and interior thin, brown and friable, and the middle part thicker, tough and hard; the *interior* integument a thin membrane. *Perisperm* none. *Embryo*; *cotyledons* equal, conform to the seed, three-nerved. *Plumula* two-lobed. *Radicle* patelliform, lodged immediately within the umbilicus, relative, centripetal.

11. S. *villosa. R.*

Leaves from five to seven-lobed; *lobes* repand, or lobate, firmly acuminate. *Panicles* pendulous. *Follicles* oblong, villous, many-seeded.

III. 154 A native of the mountainous countries to the eastward of Bengal. Flowering time, the beginning of the hot season.

Trunk straight. *Bark* smooth. *Branches* few, spreading. *Leaves* alternate, petioled, roundish, or cordate-lobate, five-nerved; there are generally from five to seven acute, long-pointed, lobate lobes; when young very downy, particularly underneath, from twelve to eighteen inches each way. *Petioles* round, as long as the leaves, or longer, downy. *Stipules* lanceolate-cordate, downy, caducous. *Panicles* terminal, the longer pendulous, the shorter drooping, or diverging; every part covered with rust-coloured down. *Flowers* numerous, male and hermaphrodite mixed; the former by far the most numerous; all are pretty large; *border* of a pale yellow, or straw-colour, and the bottom of the bell pink. *Bractes* filiform, caducous. *Calyx* campanulate, outside downy.

Hermaphrodite Flowers. *Anthers* ten, two-lobed, inserted on the toothed edge of a membranaceous ring, which surrounds the base of the germs. *Germs* globular, elevated above the base of the corol by a curved cylindric column. *Style* single, the length of the germs, and recurved so much as to bring the five-lobed stigma into contact with the anthers. *Capsules* five, or fewer, &c. as in the germs, and covered with soft, rust-coloured down.

Male Flowers. *Calyx* as in the hermaphrodite. *Stamens;* column, as long as the hermaphrodite, style and column taken together, hooked, apex a little enlarged for the reception of ten small twin anthers round its margin, in their centre, consisting of five glands, the representation of a pistil.

12. S. *fœtida. Willd.* ii. 874.

Leaves digitate.

Clompanus major. *Rumph. Amb.* iii. *t.* 107. but Karil, *Rheed. Mal.* iv. *t.* 36. is a *Vitex* and I presume, *leucoxylon.*

S. *fœtida. Sonnerat. Chin.* ii. *p.* 234. *t.* 132.

III. *Tam.* Kudra-plukku.

155 Jungli-budam, (wild almond) is the name it is known by amongst the Musselmans on the Peninsula.

A tall stout tree, a native of the interior parts of the Peninsula of India. In the Botanic garden it blossoms in March, and the seed ripens about six months afterwards.

Trunk tall and straight. *Branches* verticelled, and horizontal. *Bark* ash-coloured, and pretty smooth. *Leaves* crowded about the ends of the branchlets, long-petioled, digitate. *Leaflets* from six to twelve, lanceolar, entire, smooth. They are perfectly deciduous during the cool season in Bengal. *Stipules* ensiform, caducous at an early period. *Racemes* immediately under the young leaves of the present year, horizontal, compound, about as long as the petioles, smooth. *Flowers* large, of a dull crimson and orange, variously blended, most of them male-hermaphrodite. *Bractes* very small. *Calyx* hypocrateriform, deeply five-cleft, deciduous. *Segments* lanceolate, villous on the inside. *Column* of the fructification long, and much curved. In the *male-hermaphrodite* its apex is more enlarged, and forms a campanulate receptacle for the germ, on the margin of which twelve or fifteen anthers sit, and in its bottom the five-lobed abortive germ without style or stigmas. In the *fertile hermaphrodite* it is more robust, with an acetabuliform apex, round its margin are about the same number of anthers. *Germs* round, very villous, five-lobed, five-celled, in each about from twelve to twenty seeds, attached in two vertical rows to the inner angle of the cell. *Style* curved. *Stigmas* five-lobed. *Capsules*, from one to five come to maturity, singly about the size of a man's fist, broad-reniform, pretty smooth, ligneous and fibrous, lined on the inside with a thick parchment-like web of waved transverse fibres; one-celled, one-valved. *Seeds* several, from ten to fifteen, of the size of filberts, oblong, attached alternately to the ligneous margins of the

III. follicle, hard and smooth. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the

156 seed, five-nerved, thick and fleshy. *Plumula* two-lobed; *lobes* digitate, hairy. *Radicle* ovate, pointing to the end of the seed most remote from the umbilicus.

On the Peninsula, where the tree is indigenous, the seeds are roasted, and eaten like chesnuts, though not much esteemed.

ABROMA. Schreb. gen. N. 1217.

Calyx five-leaved. *Petals* five, with cucullate base. *Staminiferous tube* five-cleft, the bottom of each fissure bearing three anthers. *Styles* five. *Capsules* five-winged, five-celled, gaping at top. *Seeds* many.

A. *augusta. Willd.* iii. 1424.

Abroma fastuosa. *Gært.* 307. *t.* 64.

Beng. Ullat kumul.

Theobroma augusta. *Mill. Illustr.* iii. *p.* 583.

Abroma *Wheeleri. Retz.* v. 27. *Willd.* iii. 1425. is no doubt the same.

Gossipium demonum. *Rumph. Amb.* iv. *t.* 14.

A native of various parts of India, growing to be a small tree. Flowers most profusely

during the rains, and the seeds ripen in the cold season. The bark abounds with strong, white fibres, which make a very good substitute for hemp, and as the plant grows so quickly, as to yield two, three, or even four crops of cuttings annually fit for peeling, it may be advantageously cultivated for its fibres, which though not so strong as hemp, make good common cordage, &c. Page Carey Ed.

DOMBEYA. (Cavan.)

Calyx five-parted, *exterior* bractiform. *Petals* five. *Stamina* twenty, of which five are barren. *Style* five-cleft. *Capsules* five, coloured, one-celled, one or more seeded.

1. D. *ovula. Cavan. Diss.* iii. *p.* 127. *t.* 41. *f.* 2. III. 157

Leaves cordate-oblong, obtusely gland-serrate, from three to five-nerved, downy, particularly underneath. *Corymbs* terminal, dichotomous, with the extreme ramifications umbelliferous. Found indigenous on the Mauritius by Colonel Hardwicke, in flower in June and July. All the young parts densely clothed with minute, stellate, ferruginous pubescence.

2. D. *tiliæfolia. Willd.* iii. 725.

Shrubby. *Leaves* from five-angled, and sub-rotund, to cordate, all are serrate. *Stipules* subulate. *Corymbs* axillary, solitary, bifid.

A very handsome, uncommonly scabrous shrub, a native of the Mauritius, from thence sent to the Botanic garden where it throws out most copiously its numerous corymbs of pretty, large, pale, rosy flowers, about the beginning of the cool season. While the plants are young, until the floriferous branchlets appear, the leaves are five-angled; afterwards they become simply cordate.

PENTAPETES. Schreb. gen. N. 1122.

Calyx double; the *exterior* one three-leaved, caducous; the *interior* one five-parted. *Corol* five-petalled. *Stamens* twenty, of which five are longer and sterile. *Capsule* five-celled, many-seeded; *partition* contrary.

P. *phoenicea. Willd.* iii. 727.

Leaves hastate-lanceolate, crenate-serrate.

Ruktuka, Bhundhuka, Sanscrit names.

Beng. Kat-Lala, Doopahuria.

Naga-pu, *Rheed. Mal.* x. *t.* 56, is evidently this plant, while Sjasmin, *vol.* x. *t.* 1, is *Hibiscus phoeniceus.*

This elegant plant is annual, a native of wet rice-fields. Flowering time, the rainy season. III. 158

Stem erect, with many simple, erect branches; when growing on a good soil from two to five feet high, smooth, except for a few small, depressed, stellate hairs. *Leaves* petioled, alternate, hastate, linear-lanceolate; *margins* waved, and deeply serrate-crenate, pretty smooth on both sides. *Petioles* from one to two inches long, round. *Stipules* subulate. *Peduncles* axillary, solitary, short, two-flowered; *pedicels* three times longer than the peduncles, joined near the apex. *Bractes* about the base of the peduncles and pedicels, subulate. *Flowers* nodding, large, bright red, expanding at noon and dropping by day-light next morning. *Calyx* double; the *exterior* one three-leaved, caducous; the *interior* one deeply five-parted; *divisions* lanceolate, bristly. *Petals* five, triangular, inserted by evident sutures into the base of the staminiferous tube. *Stamens* fertile; *filaments* fifteen, short. *Anthers* sub-sagittate. *Sterile filaments* (or *nectaries,*) five, linear-lanceolate, nearly the length of the corol, one between every three fertile filaments, and with them united at the base into a short conical tube. *Germ* half hid in the tube formed by the base of the filaments. *Style* the length of the sterile filaments. *Stigma* clavate, and spirally twisted. *Capsule* sub-globular, bristly, five-celled, five-valved. *Seeds* from eight to twelve in each cell, disposed in two vertical rows.

PTEROSPERMUM. Schreb. gen. N. 1124.

Calyx five-cleft. *Corol* five-petalled. Five of the twenty stamens, sterile. *Germ* pedicelled, five-celled; *cells* few or many-seeded; *attachment* interior. *Capsule* woody, five-celled. *Seeds* winged. *Embryo* erect, plaited, and furnished with a perisperm.

1. P. *acerifolium. Willd.* iii. 729, &c.

Leaves peltate, ovate, repand.

Pentapetes acerifolia. *Linn. Cavan.* &c.

Kurnikara, the Sanscrit name. III. 159

Beng. Kunuk-champa.

I cannot say where the tree is indigenous; in Bengal, it is found in the gardens only, and is yet but twenty-five or thirty feet high; but seems to be naturally a very large tree. Flowering time, the beginning of the hot season.

Trunk short, tolerably straight. *Branches* spreading, but not near so numerous as in P. *suberifolium. Bark* smooth, light ash-coloured. *Leaves* petioled, alternate, bifarious, peltate, oval, repand, when young covered with much stellate down, as is every tender part of the tree, the same as in P. *suberifolium;* when full-grown, upper side is smooth, and the under side remarkably hoary; length from eight to twelve inches. *Petioles* round. *Stipules* many-cleft, caducous. *Peduncles* axillary, very short, one or two-flowered. *Bractes* many-cleft, like the stipules. *Flowers* very large, pure white and fragrant. *Calyx* as in P. *suberifolium. Petals* obliquely wedge-shaped. *Stem, pistil,* &c. as in the genus. *Germ* as in the ripe fruit, only each of the five cells is nearly divided into two, by a membrane, which is not visible when ripe.

Page Carey Ed. *Capsule* ligneous, five-seeded, oblong, fully six inches long and about three in diameter, covered with a coarse dark brown, mealy substance, five-celled, five-valved. *Seeds* about twenty in each cell, attached in two rows to the inner edge of the triangular valves, obliquely oval, compressed; from the upper end, a large brown, membranaceous, thin wing rises. *Integument* single, smooth, brown. *Perisperm* rather gelatinous, in small quantity, entering into the various foldings of the cotyledons. *Embryo* conform to the seed, nearly erect, pure white. *Cotyledons* two, large, very thin, variously folded or wrinkled. *Radicle* cylindric, inferior, its apex immediately opposite to the umbilicus of the seed.

III. 160 The flowers, like those of P. *suberifolium*, render water gelatinous.

2. P. *suberifolium. Willd.* iii. 728.

Leaves cuneate-oblong, towards the apex repand-dentate.

Pentapetes *suberifolia. Linn. Cavan. &c.*

Moochukoonda. *Asiat. Res.* ii. 349.

Tam. Taddo-marum.

Beng. Moochukoonda, Muskunda.

A native of mountainous tracts all over India. Flowering time the beginning of the hot season.

Trunk erect, growing to be a timber tree of middling size. *Branches* numerous in all directions; *young shoots, leaves, petioles, bractes,* and *calyx*, covered with stellate, rust-coloured hairs. *Leaves* alternate, bifarious, short-petioled, cuneate-oblong, repand-dentate round the apex, in some plants deeply lobate, sometimes even peltate and pinnatifid. *Flowers* axillary, short-peduncled, large, pure white, fragrant, something like the best cloves. *Bractes*, from four to six surrounding the base of the calyx, like an inferior perianth, wedge-formed; the exterior half variously and deeply divided. *Calyx* five-leaved; *leaflets* linear, very long, revolute, hairy on the inside. *Petals* obliquely wedge-formed. *Filaments* inserted into a columnar receptacle round the apex of the base of the oblong hairy germ, as in *Grewia. Anthers* a polliniferous groove on each side of the upper third, or fourth part of the filaments. *Germ* elevated on a strong, columnar receptacle, common to it and the stamens. *Capsule* and *seed* as in the germs. The wood is white, and too soft to be of much use.

3. P. *semi-sagittatum. Buch.*

Leaves sub-lanceolate, entire, base of the inferior half protruded. *Flowers* terminal, and solitary. *Capsule* oblong-elliptic, densely clothed with stellate pubescence.

Found by Dr. Buchanan at Chittagong, and from thence seeds were sent by him to the III. 161 Botanic garden at Calcutta in 1797, where the trees grow luxuriantly, and flower about the close of the hot season, ripening their seeds ten months afterwards. In twelve years the trees are thirty or forty feet high; thick in proportion, and promise to be larger.

Trunk straight. *Young shoots* very downy. *Bark* of the trunk and large branches ash-coloured. *Leaves* alternate, bifarious, short-petioled, spreading, lanceolate, entire, the base of the inferior half of each leaf protruded into a lobe of considerable size, and generally longer than the petiole, smooth above, hoary underneath, about six inches long, and nearly two broad. *Stipules* finely pinnatifid. *Flowers* terminal, and axillary, generally solitary, on short, downy, rust-coloured peduncles, drooping, large, pure white. *Bractes*, or *involucre*, generally three-leaved, and very downy, from three to five-parted, with divisions variously laciniate. *Calyx* five-cleft; *divisions* recurvate, linear, longer than the corol; on the *inside* white, and villous; on the *outside* clothed with brownish, stellate, short hairs. *Corol* sub-campanulate. *Petals* five, obliquely obovate-cuneate. *Filaments* fifteen, with anthers which are shorter than the style, and five abortive ones as long as the style; they are not united at the base, but inserted on the apex of the long sub-cylindrical receptacle, round the base of the germ. *Germ* a little elevated above the stamina, on a short, proper, fleshy receptacle, ovate, downy. *Style* single, filiform, as long as the abortive stamina. *Stigma* clavate. *Capsule* without angles, oblong-elliptic, from two to three inches long, and one and a half in diameter, ligneous, clothed with an immense quantity of brown, stellate pubescence, five-celled, five-valved. *Seeds* about ten in each cell, attached from the lower and inner angle in two rows to the inner edge of the triangular valves, obliquely oval, compressed; from the upper end rises a large, straight, thin, brown, membranaceous wing. *Integument* single, spongy, of a light brown. *Perisperm* amygdaline, entering into the various folds of the cotyledons. *Embryo* nearly as extensive as the III. perisperm, erect, pure white. *Cotyledons* two, foliaceous, nearly round, variously folded. *Plu-* 162 *mula* minute, conical. *Radicle* cylindric, inferior, its point immediately opposite to the umbilicus of the seed.

I am not at present possessed of any information respecting the uses the natives make of any part of this tree, nor of the quality of its timber. It grows fast to be of considerable magnitude, and it is at all times ornamental, being clothed to the ground with numerous branches, abounding in a beautiful foliage.

4. P. *canescens. R.*

Leaves cuneate-obovate, anterior margin often slightly lobed, hoary underneath. *Cells* of the capsule with as far as four seeds each.

A native of Ceylon, from thence introduced by General Hay Macdowall, into the Botanic garden at Calcutta, where it flowers in May, and the seeds do not ripen till the April following.

Trunk of trees eight years old, straight, and about as thick as a man's thigh. *Bark* smooth, ash-coloured. *Branches* nearly erect, forming a tall, slender head; *young shoots* round, and hairy; general height of our young trees about twenty-five feet. *Leaves* alternate, short-petioled, cuneate-obovate, with an obtuse point, and often tending to be lobate towards the apex; smooth, lucid green above; hoary underneath; about two inches long. *Stipules* linear,

generally entire, caducous. *Peduncles* axillary, generally in pairs, one-flowered, round, hoary. *Bractes* few, small, conical. *Flowers* smaller than in any of the other three species described by me, white. *Calyx* divided to the base into five, linear, revolute segments, which are ferruginously hoary on the outside, and hairy within. *Petals* falcate, obtuse, longer than the calyx. *Filaments* fifteen, with anthers; and five larger, abortive, all united near the base, and inserted on the elevated receptacle, round the base of the germ. *Germ* ovate, hairy, five-seeded, five-celled, with four seeds in each, attached to the axis. *Style* longer than the stamina *Stigma* clavate, five grooved. *Capsule* woolly, clavate-oblong, without angles, slightly marked with five longitudinal lines, where the valves separate, from two to three inches long, and about one in diameter, generally obtuse, densely clothed with hoary, stellate pubescence, five-celled, five-valved. *Seeds* as far as four in each cell, two generally ripening, obliquely oval, compressed; on the upper end is a thin, broad, brown, membranaceous wing. *Integuments* two; the *exterior* one thick, with a rough, brown, spongy surface; the *inner* one tough, and lightly coloured. *Perisperm* conform to the seed, thin. *Embryo* erect. *Cotyledons* foliaceous, intricately folded. *Radicle* cylindric, inferior.

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Velaga xylocarpa, *Gært. Sem.* ii. 245. *t.* 133. *f.* 2, agrees uncommonly well with the carpology of this, except in the number of seeds in each cell of the capsule; here there cannot be more than four, that being the number of their rudiments in the germ.

5. P. *lanceæfolium. R.*

Leaves lanceolate, acuminate, entire. *Flowers* axillary, long-peduncled. *Capsule* lanceolate; *cells* from two to four seeds.

Beng. Bun Kulla.

A tree, a native of the forests in the neighbourhood of Silhet, where it blossoms about the beginning of the rains in May and June; and the seed ripens at the beginning of the cold season.

Young shoots slender, hoary, and uncommonly straight. *Leaves* alternate, short-petioled, lanceolate, with a round base, entire, acuminate, hoary underneath, from three to six inches long by one and a half broad. *Stipules* generally bifid, or trifid, ferruginous. *Peduncles* axillary, half the length of the leaves, round, slender, clavate at top, supporting a single, pretty large, white fragrant flower. *Bractes* two, or three, rather above the middle of the peduncle, like the stipule, but more divided. *Calyx* five-cleft; *segments* linear, revolute, hoary. *Petals* five, rather longer than the calyx, obliquely cuneiform. *Stamina* as in the genus, viz. fifteen fertile filaments, with five longer, sterile ones; all are united at the base, and inserted on the cylindric receptacle, which elevates them and the germ. *Anthers* fifteen, linear, erect. *Germ* oblong, five-celled, with about four seeds in each, attached to the axis. *Style*, the length of the sterile filaments. *Stigma* clavate. *Capsules* lanceolate, hoary, with very light gray, soft, short pubescence, very obscurely five-cornered, five-celled, five-valved. *Seeds*, from two to four in each cell, attached as in the germ, oval winged; the wing nearly as broad as the seed, and about three or four times its length.

III. 164

MONADELPHIA POLYANDRIA.

ADANSONIA. Schreb. gen. N. 1126.

Calyx simple, five-cleft. *Style* long. *Stigma* with ten rays. *Capsule* woody, ten-celled. *Seeds* many in a pulp.

A. *digitata. Willd.* iii. 730.

This tree is scarce in India, and probably not a native of Asia, for hitherto only a few have been found of any great size at Allahabad, Masulipatam, on the coast of Coromandel, or in Ceylon. In the Botanic garden they blossom in May and June, and the seed ripens during the cool season.

General Hay Macdowell in a letter to Dr. R. dated Mantolle, (on the Island of Ceylon,) 2nd July, 1802, says:—

"In my walk last night on the ruins of this once rich and extensive city, called by the natives Maude or Maddoo-ooltum, I chanced to observe a tree whose prodigious magnitude induced me to measure it, and I found it to be nearly fifty feet in circumference, above six feet from the ground, the natives call it *Peerig*, and from what I have been able to collect, it is not indigenous here. There are a great many of them scattered about at this place, and it seems to me to be the *Adansonia*."

In the Botanic garden at Calcutta, are many trees, the largest is about twenty-five years old, with an irregular, short, sub-conical trunk, which is eighteen feet in circumference, from four to five feet above ground; the branches diverge far all round: the leaves are deciduous during the cold season, and appear with flowers in May and June.

III. 165

BOMBAX. Schreb. gen. N. 1127.

Calyx simple, from three to five-toothed. *Corol* five-petalled. *Stamina* five, or many. *Capsule* five-celled, five-valved. *Seeds* woolly.

1. B. *pentandrum. Willd.* iii. 731.

Trunk while young, armed. *Flowers* drooping, pentandrous. *Styles* declined. *Stigma* entire. *Leaves* digitate.

Teling. Cadami.

Ceiba pentandra. *Gært. Sem.* ii. 244. *t.* 133.

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Panja. *Rheed. Mal.* iii. *p.* 49, 50, and 51. The first of these gives a good idea of the general habit of the tree. Rumphius's fig. *(vol.* i. *t.* 10*)* is too bad to be quoted.

Beng. Shwet simool.

This elegant, straight, sub-verticelled tree, seems to differ from the West India species, probably specifically; it is found in every part of India. On the Coromandel coast, the Tamuls plant them about their temples. In Bengal, where the winters are colder, the leaves drop off during the cold season. In February, when destitute of foliage, the blossoms appear, and soon afterwards the leaves; and the seed ripens in May.

III. 166 *Trunk* perfectly straight, in large trees five or six feet in circumference, tapering regularly like the mast of a ship.* *Bark* smooth, and thinly armed with conic-based prickles, while young, green, then ash-coloured; *branches* sub-verticelled, and spreading horizontally like the stages of the compound table called a *dumb waiter;* they are generally in threes, and at all times destitute of prickles, and like the trunk, covered with smooth, ash-coloured bark. *Leaves* alternate, petiolate, digitate. *Leaflets* short-petioled, generally seven in number, though sometimes varying from four to ten, lanceolate, entire, and smooth on both sides, the interior by far the smallest, being from one to two inches long, while the exterior are two or three times longer. *Petioles* round, about the length of the longest leaflets. *Stipules* small, caducous. *Flowers* numerous, in fascicles, about the end of the branchlets, pretty large, of a dull white colour, peduncled, drooping. *Peduncles* clavate, three, four, five, or more from the axillary germ of the fallen leaf; one-flowered, round and smooth. *Calyx* one-leaved, four or five-toothed; on the *outside* a little rugose, on the *inside* somewhat villous. *Petals* five, oblong, spreading, villous on the outside, smooth within. *Filaments* five, curved, smooth, rather shorter than the corol, united at the base into a thick fleshy envelope for the germ. *Anthers* large, consisting of two or three variously convoluted lobes, with a double line of bright yellow pollen on the exterior margin. *Germ* conical. *Style* as long as the stamens, much contracted near the base by the fleshy envelope, formed by the united bases of the filaments, immediately above it is much swelled, and considerably bent to one side. *Stigma* headed, obscurely five-lobed. *Capsule* (in our Indian plant) oblong, in size and shape like a smooth skinned cucumber, when ripe somewhat ligneous, and not readily opening spontaneously, five-
III. 167 celled, five-valved, partitions membranaceous. *Seeds* numerous, somewhat pear-shaped, smooth, black, each involved in its own proper portion of very fine, soft, silky wool, which in this species adheres slightly to the seed.

2. B. *heptaphylla. Willd.* iii. 732.

Trunk and *branches* armed. *Leaves* digitate; *leaflets* cuspidate. *Stamina* numerous, in two series of fascicles. *Stigma* five-cleft.

Moul elavou. *Rheed. Mal.* iii. *p.* 61. *t.* 52.

Salmuli, the Sanscrit name; see *Asiat. Res.* iv. 296.

Beng. Simul.

Teling. Boorgha.

This is one of the largest of our Indian trees and is found almost every where; over the northern Circars, near the mountains, they grow to a greater size than I have seen them any where else, often about one hundred feet high, the trunk thick and ramous in proportion. Flowering time, the end of winter, when the tree is totally destitute of leaves. The great numbers of very large, bright red flowers with which it is then covered, makes it remarkably conspicuous at a very great distance.

Trunk straight, covered with innumerable, crowded, short, sharp, conic aculei, the bark is also very scabrous, and deeply cracked, outwardly ash-coloured, inwardly red. *Branches* sub-verticelled, variously bent, but generally in a horizontal direction, and armed like the trunk. *Leaves* alternate, long-petioled, digitate. *Leaflets* five, six, or seven, petiolated, broad-lanceolate, long, fine-pointed, entire, smooth on both sides, from six to twelve inches long. *Petioles* longer than the leaflets, round, smooth. *Petiolets* short, channelled on the upper side. *Stipules* small, caducous. *Flowers* numerous, collected in fascicles at and near the extremities of the otherwise naked branchlets, very large, of a bright, lively red colour; they contain a large portion of sweet liquid, which birds are fond of. *Bractes* small, caducous. *Calyx* cup-shaped,
III. circumcised, of a thick leathery texture; covered on the inside with white, silky down; on the
168 outside pretty smooth. *Border* in general obscurely three or four-parted; as the corol expands, these are often so much split, as to appear four, five, or more cleft, separating to near the permanent base, which, with the corol and stamina, drop off in one body. *Corol* of five, very distinct, oblong, first spreading, then recurved, contorted, smooth, deep red, fleshy, oblong petals, of about twice the length of the stamens. *Filaments* in two series; the *interior* ones pressing on the style, and consisting of five longer and thicker, and ten shorter; the *exterior* series contains from fifty to sixty, united into five, distinct phalanges, all these are united at the base, into one fleshy envelope for the germ. *Anthers* incumbent, involute, reniform, those of the larger filaments of the interior series are double, on all the rest single pollen, the colour of Scotch snuff. *Germ* conical. *Style* longer than the stamina. *Stigmas* five, subulate, recurved. *Capsule* oblong, tapering equally toward each end, five-celled, five-valved, downy on the outside. *Seeds* numerous, obovate, smooth, except a sharp, cross-shaped ridge on one side, immersed in a very large quantity of very fine silky wool; this wool does not adhere to the seeds, but rather seems to grow from the inside of the valves of the capsule.

* Jacquin says of the West India tree, "Truncus est erectus, figura valde inequali, rarissime regularis sæpius circa medium ventricosus, aut crassior superne quam in ipsa basi, &c." which makes me doubt their being the same. Gærtner's figure of the pericarpium of the same plant, which he calls *Ceiba pentandrus* is also much too thick at the apex for our Indian tree.

In my description of this tree, I have been particularly full, because I am inclined to think it differs essentially from the West Indian species, which Linnæus called *Ceiba*. Jacquin's full, and I presume, accurate description of that tree is now before me, and leaves in my mind little doubt of their being very different. This and the former *pentandrum*, are the only species of this genus I have hitherto met with in India, except B. *gossypinum*, which is polyandrous. If this be not what Linnæus calls B. *heptaphyllum*, and Jacquin, *Septenatum*, I cannot say what it is. He quotes *Moul elavou* of the *Hortus Malabaricus* for it; and at the same time points it out to be an American tree. Be that as it may, there can be no doubt of Rheed's plant being the one I have now described and figured. Page Carey Ed. III. 169

The wood is white, light and spongy, fit for very few purposes. In India the wool is used to stuff beds and pillows, and to put between the folds of quilted cloth.

3. B. *gossypinum*. *Willd.* iii. 732.

Arboreous, unarmed. *Leaves* five-lobed; *flowers* panicled, polyandrous. *Capsule* sub-globular, five-lobed.

Teling. Kong.

A large beautiful tree, a native of the Circar mountains, it is also cultivated in gardens on many parts of the coast.

Leaves deciduous during the cold season. The *flowers* appear about the beginning of the hot season, at which time the tree is destitute of leaves, but they soon succeed the flowers. *Trunk* erect, from eight to eighteen feet high, often much thicker than a man's body; the head is large in proportion to the trunk, and very branchy. *Bark* smooth, ash-coloured. *Leaves* scattered about the ends of the branchlets, from three to five-lobed, above pretty smooth, below covered with whitish down, with the *lobes* entire, acute. I never could observe any thing like a gland on any part of the under nor upper side. *Petioles* as long as the leaves, that is from two to eight inches, downy. *Stipules* linear, acute, caducous. *Flowers* terminal, numerous, sub-panicled, very large, of a bright yellow. *Bractes* stipule-like, and caducous. *Calyx* five-leaved; *leaflets* oblong, concave. *Petals* five, obliquely obovate, obliquely and deeply emarginate, or rather cleft, spreading, embracing one another, as in the contorted plants. *Filaments* numerous, short, distinct as in many of the polyandrous plants. *Anthers* linear, nearly as long as the filaments. *Germ* above globular. *Style* rather longer than the stamens, but considerably bent to one side. *Stigma* simple. *Capsule* broad turbinate, as large as a goose-egg, five-lobed, five-celled, five-valved. *Seeds* numerous, kidney-shaped, woolly. III.

The cotton is of a soft, silky nature, not employed for any use by the natives; the wood is also very soft, and of little or no use. 170

SIDA. Schreb. gen. N. 1129.

Calyx simple, five-toothed. *Style* many-parted. *Capsule* (or *arils*) conjoined round a common receptacle, from one to three-seeded.

1. S. *microphylla*. *Willd.* iii. 739.

Suffruticose, ramous. *Leaves* from round-cuneate, to lanceolate, serrate, hoary underneath. *Flowers* solitary, decandrous. *Capsules* five, with two sub-ovate seed horns, and a double, scabrous, hairy ridge on the back.

A native of Bengal, where it is in blossom the whole year round.

Flowers expand at nine in the morning. *Trunk* trifling. *Branches* numerous, slender, straight. *Bark* of the ligneous parts ash-coloured, height of the whole plant from one to three feet. *Leaves* short-petioled, from round-cuneate to lanceolate, and rhomb-lanceolate, serrate, slightly three-nerved, hoary with white down underneath, from one to two inches long. *Petioles* villous, scarcely one-sixth part the length of the leaves. *Stipules* slender, filiform, a little flattened. *Peduncles* solitary, axillary, one-flowered, when in blossom about the length of the petioles, but lengthening much by the time the seed is ripe. *Flowers* small, yellow. *Petals* distinct, obliquely triangular. *Stamens* about ten. *Style* five-cleft. *Capsules* five, about the length of the calyx, horned, with a scabrous, hairy, double ridge running down from the horns; when ripe the upper half falls off like that of the capsula circumcissa. *Seed* solitary.

2. S. *cuneifolia*. *Roxb.* III.

Suffrutex. *Leaves* wedge-shaped, retuse, not serrate. *Flowers* solitary; *petioles, flower* and *stipule*-bearing, decandrous; *arils* five. 171

Teling. Multo-opullakum.

A small, irregular, shrubby species, found on pasture lands, about hedges, under the shade of trees, &c. It flowers through the wet and cold seasons.

Stem woody, short; *bark* gray, somewhat scabrous. *Branches* many, irregular, the whole plant is about two or three feet high. *Leaves* scattered, very short-petioled, wedge-formed, retuse, with a small toothlet in the hollow, not serrate, downy underneath, about half an inch long, and one-fourth broad. *Stipules* subulate, inserted into the petioles near their base. *Flowers* [illegible]: *branches* flexuose, with spreading filiform branchlets. *Leaves* lanceolate, serrate, smooth. *Peduncles* solitary, one-flowered. *Flowers* polyandrous. *Capsules* five, two-horned.

Beng. Kiretta.

Tsjeru-parua. *Rheed. Mal.* x. 53.

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A native of Coromandel. Flowers in the rainy and cool seasons.

4. S. *humilis. Willd.* iii. 744.

Perennial, diffuse, hairy. *Leaves* round-cordate, serrate, hairy. *Flowers* solitary, long-peduncled. *Capsules* five, hornless.

Sida pilosa. *Retz. Obs.* i. *p.* 23.

Teling. Nalla benda.

III. *Beng.* Junka.

172 Sida unilocularis, *L'Herit. nov. p.* 117. *f.* 66, is said to be an erect plant, ours is always diffuse, indeed spreading flat on the ground. I should therefore doubt their being the same.

A native of various parts of India, and in flower most part of the year.

5. S. *periplocifolia. Willd.* iii. 741.

Shrubby; *leaves* cordate-sagittate, entire, hoary underneath. *Stipules* filiform. *Peduncles* solitary, length of the leaves, one-flowered. *Capsules* five, two and three-seeded, sharp-horned. A native of the Malay Islands. Flowers and ripens its seed in the Botanic garden at Calcutta great part of the year. The bark of this abounds in serviceable flaxen fibres, and as it shoots quickly into long, simple twigs, particularly if cut near the earth, it answers well for procuring the fibre of a good length for most purposes.

6. S. *glutinosa. R.*

Herbaceous, erect, very hairy, and glutinous. *Leaves* cordate, pointed, serrate. *Flowers* numerous, fascicled. *Arils* five, shorter than the calyx, with two short conic hornlets. Seems herbaceous, but I cannot say with any degree of certainty; it is a rare, pretty large, erect species, growing chiefly on sandy ground.

Leaves alternate, petioled, cordate, serrate, acute, hairy, glutinous, in consequence, they as well as the whole of the plant, for every part exudes a tenaceous gluten, is covered with sand, or dust; from one to five inches long, and of a proportional breadth. *Petioles* round, hairy, from one to two inches long. *Stipules* bristle-shaped. *Peduncles* axillary, and terminal, generally more than one, with small leaves mixed, round, hairy, one-flowered. *Flowers* small,

III. yellow. *Arils* five, rather shorter than the calyx, obtusely two-horned, pretty smooth.

173 7. S. *polyandra. Roxb.*

Annual, or biennial, erect, ramous, pubescent. *Leaves* cordate, repand-dentate, cuspidate. *Stipules* bristle-shaped. *Flowers* solitary, drooping, sub-polyandrous; *petals* reflex. *Capsules* five, two-valved, from three to four-seeded.

A native of Coromandel, from thence introduced into the Botanic garden by Dr. Berry, where it blossoms during the cool season. It is in general annual, though sometimes the root, and lower part of the stem remains alive, and throws out new branches the second year.

Root often biennial, or more. *Stem* erect, with numerous, somewhat expanding, nearly straight, round branches, from the base to the top; all the tender parts clothed with much very soft pubescence; height of the whole plant, in a good soil, about six or seven feet; the whole decays annually down to the root, or nearly so. *Leaves* alternate, long-petioled, cordate; *margins* repand-dentate; *apex* long, and slender, with a rather obtuse point; from two to eight inches long, and from one to seven broad. *Stipules* subulate, and generally coloured. *Peduncles* axillary, solitary, one-flowered, near the apex jointed, and then so much recurved, as to make the flowers droop while expanded, general length two or three inches. *Flowers* large, yellow, remaining expanded through the day. *Petals* reflex. *Filaments* about fifty, very straight, united at the very base only, and there the short tube is hairy on the outside. *Anthers* reniform. *Germ* five-sided, hairy. *Styles* five, rather longer than the stamina. *Stigmas* headed, but small and smooth. *Capsules* five, much longer than the calyx, each terminating in a sharp, single, conic horn, until ripe, when it splits in two on both sides, from the apex to the base, in fact, completely two-valved, and one-celled. *Seeds* three or four in each capsule, obliquely-

III. reniform, attached to the common axis above the middle.

174 8. S. *alba. Willd.* iii. 757.

Suffruticose. *Leaves* cordate-ovate, serrate, downy, insertions of the petioles embraced by three large glands. *Flowers* axillary, fascicled; *arils* from five to six, two-horned.

Teling. China-mootam.

This is a small shrubby, perennial plant. A native of lands that have lately been in cultivation. It flowers during the wet and cold seasons.

Stem erect, winding from branch to branch, often coloured. *Branches* many, arising; *young shoots* covered with mealy, soft, stellate down. *Leaves* alternate, petioled, three-nerved, cordate, obtuse, sometimes nearly retuse, and the base often topped as if cut across, serrate, downy; from half an inch to two inches long. *Petioles* half or three quarters the length of the leaves, their insertions surrounded with three large, hard glands, one on each side, and one below. *Stipules* subulate, inserted into the lateral glands. *Peduncles* axillary, several, short, one-flowered. *Flowers* small, white. *Petals* obliquely triangular. *Arils* from five to six, hid in the calyx, two-horned; horns divaricate. The stipulary glands are a good specific mark.

9. S. *alnifolia. Willd.* iii. 741.

Suffruticose. *Leaves* from oval to round, serrate, downy. *Peduncles* axillary, solitary. *Stamina* from twelve to fifteen; *fascicles* from three to six. *Capsules* from five to seven, shorter than the calyx, two-horned.

Teling. Ter-nalla-benda.

A native of the Circars, and like the rest, flowers during the rains and cold season.

10. S. *chinensis. Retz. Obs.* iv. *N.* 94.

Suffruticose. *Leaves* oval, serrate, hoary underneath; *peduncles* solitary, one-flowered; *stamens* thirty; *arils* from six to seven. Small, ramous; *bark* of the woody part whitish;

young parts purple-coloured, slightly scabrous, covered with soft stellate down, which without a lens seems to be farina. *Leaves* alternate, short-petioled, very various in form on the same plant, viz. orbicular, oval, wedge-formed, narrow lance-rhombiform, all obtuse, and in general serrate, three-nerved; above pretty smooth, below hoary, from half an inch to an inch and a half long, breadth various; *margins* often coloured. *Stipules* linear, inserted into glands. *Peduncles* axillary, solitary, erect, as long or longer than the leaves, jointed above the middle, one-flowered. *Flowers* yellow. *Filaments* about thirty, issuing single from the mouth of the tube, irritation sets them in motion. *Arils* from six to seven, turnip-formed, shorter than the calyx, without horns, pretty smooth. 175

Note. I have seen a variety with white flowers. They have a heavy, disagreeable smell.

11. S. *Napaca. Willd.* iii. 766.

Shrubby. *Leaves* acutely-lobed, serrate-dentate. *Peduncles* from four to six-flowered. *Capsules* about seven or eight, acuminate.

Napaca *hermaphrodita. Ed. sp. pl.* 965.

Sida *Napaca. Cavan. Diss.* v. *p.* 277. *t.* 132. *f.* 1.

Native place very doubtful. Flowers during the cold season in the Botanic garden at Calcutta.

12. S. *lanceolata. Willd.* iii. 736. *Retz. Obs.* iv. *p.* 28.

Perennial, erect. *Leaves* ovate-lanceolate, serrate, villous. *Stipules* lanceolate, sometimes ciliate. *Peduncles* solitary, the length of the stipules. *Capsules* from eight to ten, two-horned, shorter than the calyx.

A native of Bengal. Flowers in the cold season.

13. S. *retusa. Willd.* iii. 740.

Shrubby. *Leaves* short-petioled, cuneate, serrate, retuse, hoary underneath. *Stipules* filiform. *Peduncles* axillary, solitary, shorter than the leaves, one-flowered. *Capsules* from eight to ten, one-horned.

Kurundoti. *Rheed. Mal.* x. *t.* 18. III. 176

Silagurium vulgare. *Rumph. Amb.* vi. *t.* 19.

A native of Bengal and the Moluccas. Flowers in the cool season, in the Botanic garden at Calcutta.

14. S. *rhomboidea. Roxb.*

Shrubby, erect, ramous. *Leaves* short-petioled, narrow-rhomboidal, serrate, three-nerved, villous. *Stipules* setaceous. *Peduncles* axillary, solitary, shorter than the leaves, one-flowered. *Capsules* ten, without beak.

Hind. and *Beng.* Sufet or Shwet Bariala, or Berela.

A native of Bengal, where it blossoms during the cold season. The flowers expand at noon.

Stem erect, ligneous. *Branches* ascending; *young shoots* a little mealy, height of the whole plant from three to six feet. *Leaves* alternate, short-petioled; the inferior in young plants rhomboidal; the superior amongst the flowers lanceolate, all are serrate, more or less three-nerved and villous, particularly underneath, and there hoary also; size very various. *Stipules* longer than the petioles, bristle-shaped. *Peduncles* axillary, solitary, slender, erect, shorter than the leaves, one-flowered; the smaller branchlets in the axills of the leaves, with their flowers often give the appearance of two or more flowers from the same axill. *Corol* sub-rotate, small, pale yellow. *Petals* very obliquely and deeply retuse. *Stamens* numerous from the apex of their tube. *Style* about ten-cleft. *Capsules* (or *arils*) generally ten, forming, before ripe, a depressed, somewhat umbilicated orb, and nearly covered by the incurved divisions of the calyx singly; when ripe, gaping at the top, and having then the appearance of being two-horned. *Seed* solitary. It differs from *rhombifolia* (Linn.) in the arils having no horns.

15. S. *rhombifolia. Willd.* iii. 740.

Shrubby, coloured. *Leaves* short-petioled, rhomb-lanceolate, serrate, soft underneath. *Peduncles* solitary, nearly as long as the leaves, one-flowered. *Stipules* filiform. *Capsules* ten, with one straight sharp horn. III. 177

Malvinda unicornis. *Dill. Elth.* 216. *t.* 172. *f.* 212.

Sida foliis lanceolato-rhomboidibus. *Flor. Zeyl. N.* 252.

Hind. and *Beng.* Lal-bariala, or berela.

A native of Bengal; flowers during the rainy season.

The bark of this and the last, *(rhomboidea)* yield abundance of very delicate flaxy fibres, and I think might be advantageously employed for many purposes. When the seed is sown thick on a good soil, the plants grow tall and slender, without branches, and every way fit for such purposes.

16. S. *cordifolia. Willd.* iii. 758. *Fleming in Asiat. Res.* xi. 178.

Herbaceous, downy, and hairy. *Leaves* cordate. *Peduncles* solitary, one-flowered. *Capsules* ten, with two long straight, backwardly hispid horns.

Katu-uren. *Rheed. Mal.* x. *t.* 54.

Batyulaka, its Sanscrit name.

Hind. and *Beng.* Bariala, or barela.

A native of Coromandel, Bengal, &c. and with the rest blossoms during the rains, and cool season.

With more than ten, from two to three-seeded Capsules.

17. S. *crispa. Willd.* iii. 747.

Stem sub-erect, with long, diffuse branches. *Leaves* petioled and sessile, round-cordate, crenate, acuminate, downy. *Stipules* filiform. *Peduncles* solitary, filiform, one-flowered.

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Pericarp perfectly globular, and pendulous. *Capsules* twelve, oval, inflated, from two to three-seeded.

A native of the coast of Coromandel. In blossoms during the greater part of the year.

18. S. *abutilon. Willd.* iii. 750.

Annual, erect, coloured, villous. *Leaves* cordate, acuminate, dentate-serrate. *Peduncles* axillary, solitary. *Capsules* fourteen or fifteen, from two to three-seeded, hairy, much longer than the calyx, reniform, with a long, spreading, sharp, two-partible horn.

Abutilon læve. *Rumph. Amb.* iv. *p.* 31. *t.* 11.

A native of various parts of India, though not common. The seed has been received from Pekin into the Botanic garden under the name *King-ma* and is said to be cultivated in that Province as a substitute for hemp and flax.

19. S. *tomentosa. Roxb.*

Annual, erect, very downy. *Leaves* round-reniform, grossly serrate. *Peduncles* axillary, one-flowered; *arils* twenty, reniform, very downy.

A native of rubbish, road sides, hedges, &c. where the soil is good, but a very rare species. Flowers during the cold season.

Stem annual, sub-erect, from three to four feet high, branchy, round, very downy, as is every part of the plant. *Branches* ascending, stem-like. *Leaves* alternate, petioled, rather round kidney-formed, some few are pointed, but in general rounded at the apex, irregularly toothed, very downy, about as long as the petioles, size very various, the larger are about five or six inches long, and from four to five broad. *Stipules* lanceolate, reflected. *Peduncles* axillary, solitary, one-flowered, shorter than the petioles where the leaves are large. *Flowers* large, of a bright deep orange colour. *Petals* obliquely triangular; the *interior* margin deeply divided into two unequal lobes. *Capsules* about twenty, nearly as high as the calyx, in a depressed verticel, very downy, reniform, equally rounded at each end, this mark distinguishes it immediately from S. *indica*, and *asiatica*. *Seeds* generally three, a little scabrous, white,

III. 179

bearded.

20. S. *asiatica. Willd.* iii. 750.

Biennial, downy, and glutinous. *Leaves* round-cordate, subulate, grossly serrate. *Peduncles* solitary, one-flowered. *Petals* obliquely triangular, embracing each other. *Capsules* about twenty, equalling the calyx, truncate, with a conic hornlet. *Eye* of the seed bearded.

Teling. Tootea-benda.

Hind. and *Beng.* Petaree, also Jhampi.

A native of various parts of India, and in blossom and seed most part of the year.

21. S. *populifolia. Willd.* iii. 751.

Sub-herbaceous, villous, not glutinous. *Leaves* round-cordate, sub-lobate, grossly serrate. *Petals* obliquely triangular, and remote. *Capsules* twenty, truncate, longer than the calyx.

Teling. Noogoo-benda.

Beloere. *Rheed. Mal.* vi. *t.* 45.

A native of various parts of India, and like *asiatica* in flower and seed all the year.

22. S. *indica. Willd.* iii. 752.

Sub-herbaceous. *Leaves* round-cordate, sub-lobate, grossly serrate. *Petals* evenly obcordate, embracing each other. *Capsules* twenty, truncate, longer than the calyx.

I have not been able to learn that the natives have any other name for this than that by which *populifolia* is known, and with it, and *asiatica* it is found common over most parts of India; on the coast of Coromandel, these species are most generally used as a substitute for the officinal Althæ and Malvæ.

23. S. *graveolens. R.*

III. 180

Herbaceous, erect, ramous, every part clothed with clammy pubescence. *Leaves* round-cordate, crenulate, rarely lobate. *Stipules* falcate. *Flowers* axillary, solitary. *Corol* rotate, fruit sub-globular, compound, of about twenty, obliquely reniform, three-seeded capsules.

Hind. Bura-banghi about Cawnpore, where indigenous. From that place Colonel Hardwicke sent the seeds to the Botanic garden where the plants thrive most luxuriantly, and blossom chiefly about the close of the rains, and beginning of the cold season. In a favourable soil they grow with an erect stem to the height of six, eight, or even more feet; with numerous, spreading branches, forming a beautiful, large, ovate bush; all the young parts are covered with much clammy down, intermixed with some larger, very soft hairs.

Leaves alternate, petioled, round-cordate, crenulate, five or seven nerved; the larger ones on the stems of the young luxuriant plants are sometimes slightly lobate; both sides covered with the same clammy pubescence, from two to twelve inches each way. *Petioles* almost as long as the leaves. *Stipules* reflexed, narrow-falcate, acute. *Peduncles* axillary, solitary, sub-erect, generally shorter than the petioles, one-flowered. *Flowers* large, of a deep orange colour, with a dark ferruginous spot in the centre. *Corol* rotate; lancinia obcordate. *Pericarpium*, fruit almost round, nearly the length of the calyx, composed of about twenty, three-seeded, villous, obtuse-pointed capsules. The fresh plant possesses a strong, peculiarly unpleasant smell.

ALTHAEA. Schreb. gen. N. 1132.

Calyx double; the exterior one from six to nine-cleft. *Capsules* many, one-seeded.

A. *rosea. Willd.* iii. 773.

Herbaceous, erect, ramous. *Leaves* from five to seven-lobed, angular.

Alcea rosea. *Linn. Miller's Illustrations.* Page
Holly-hock. Carey
Hind. Gool-khyru. Ed.
Pers. Kuli-humesha, Babor. III.
181

As in Europe, the varieties of this plant are numerous over India; but always in a cultivated state only; at least I have never met with it in any other. Our most beautiful sorts come from China.

MALVA. Schreb. gen. N. 1143.

Calyx double; the exterior one three-leaved. *Capsules* many, one-seeded.

1. M. *Mauritiana. Willd.* iii. 787.

Annual, erect. *Leaves* five-lobed. *Peduncles* and *petioles* smooth.

M. *sinensis. Cavan. Diss.* ii. *t.* 25. *f.* 4.

The Hindoos of these parts have no name for this plant, it is only found in gardens; the seeds are generally brought from Hydrabad. It is annual; flowering time the cold season.

Stem erect, smooth, shining, from three to five feet high. *Leaves* alternate, petioled, of a roundish kidney-form, slightly five or seven-lobed, five or seven-nerved, crenulate, soft, but smooth, from two to six inches each way. *Petioles* as long as the leaves, round, smooth. *Stipules* oval, acute. *Peduncles* axillary, several, round, smooth, about two-thirds shorter than the petioles, one-flowered. *Flowers* numerous, large, of a beautiful pale, rose-colour, striated with deep red. *Exterior calyx*, the leaflets narrow-cordate, inserted upon the inner calyx, smooth. *Petals* remote, broad wedge-formed. *Arils* from ten to fifteen, depressed, umbilicated.

2. M. *rotundifolia. Willd.* iii. 786.

Annual, prostrate. *Leaves* cordate, obsoletely five-lobed.

A native of Persia, as well as of Europe.

URENA. Schreb. gen. N. 1137.

III.
182

Calyx double; the exterior one five-cleft. *Capsule* five-celled, five-partible; *divisions* one-seeded.

1. U. *lobata. Willd.* iii. 800.

Perennial, bushy. *Leaves* round-cordate, angled. *Capsules* glochidate.

Beng. and *Hind.* Bun ochra.

Lappago Amboynica. *Rumph. Amb.* vi. *t.* 25. *f.* 2.

Common over most parts of India. Flowers during the rains and cool season in Bengal.

2. U. *sinuata. Willd.* iii. 802.

Perennial, bushy. *Leaves* sinuous, palmate, hairy, sinuses obtuse; lobes gashed; *margins* serrate-cuneate. *Capsules* glochidate.

Uren. *Rheed. Mal.* x. *t.* 2.

Beng. and *Hind.* Kungooya.

Teling. Palia mankena.

Malvinda foliis inferioribus multifidis. *Burm. Zeyl. t.* 69. *f.* 2.

This is also common over most parts of India. The bark of these two yields a strong and tolerably fine substitute for flax.

3. U. *palmata.*

Erect, ramous; tender parts clothed with stellate pubescence. *Leaves* long-petioled, roundish, many-lobed, serrate-dentate. *Capsules* smooth.

Found in Rohilcund by Col. Hardwicke, in flower and seed in September,

4. U. *repanda.*

Shrubby, erect, ramous, pubescent. *Leaves* ovate-cordate, repand, serrate-dentate. *Capsules smooth.* III.

A low, stout, very ramous species, a native of Coromandel; flowers in October. 183

GOSSYPIUM. Schreb. gen. N. 1138.

Calyx double; the exterior one three-parted. *Capsules* from three to five-celled. *Seeds* clothed with cotton wool.

1. G. *obtusifolium. R.*

Shrubby, very ramous. *Leaves* small, with three, rarely five, obtuse, ovate, entire lobes. *Stipules* falcate. The *exterior calyx* with entire divisions. *Capsules* ovate; *cells* three-seeded. *Seeds* free and clothed with firmly adhering, short, greenish-gray down, under a small portion of ash-coloured wool.

A native of Ceylon, but not cultivated. Flowers during the rains and cold season in the Botanic garden at Calcutta.

2. G. *arboreum. Cavan. Diss.* vi. 311. *t.* 193. *Willd.* iii. 804.

Shrubby, thin of branches. *Leaves* from three to five-lobed, hairy. *Stipules* ensiform. *Leaflets* roundish pointed. *Seeds* free, but downy under the white wool.

G. *herbaceum. S. Xylon Madraspatense rubicundo pentaphyllum. Pluck. Am. p.* 172. *f.* 3. seems to me to be this plant, but I cannot bring myself to think *Cudu pariti* of the *Hortus Malabaricus*, i. *t.* 31. to be the same. It may probably be Gærtner's *Gossypium religiosum.* In both, the capsules are nearly round, and I know of no other species with any thing like

Page Carey Ed. a round pericarpium.

It is found in the gardens of the curious over most parts of India, where it is in flower great part of the year.

III. From my enquiries and observations, it does not appear ever to be cultivated for its wool.

184 3. G. *herbaceum. Willd.* iii. 803.

Bi-triennial; *young parts* hairy. *Leaves* hoary, palmate, with sub-lanceolate, rather acute lobes. *Stipules* falcate-lanceolate. *Leaves* of the exterior calyx dentate. *Capsules* ovate, pointed. *Seeds* free, clothed with firmly adhering, white down, under the long white wool.

Gossypium. Capas. *Rumph. Amb.* iv. *p.* 33. *t.* 12.

Sans. Karpassee.

Hind. Rewee.

Beng. Kapass.

G. *herbaceum. Cavan. Diss.* vi. *p.* 310. *t.* 164. *f.* 2.

Arab. Kootn.

Teling. Pati-chittoo the plant, and Pati the cotton itself.

This and its varieties are by far the most universally cultivated by the natives of India. The most conspicuous of these varieties are the Dacca, Berar, and China cottons.

Dacca Cotton may be reckoned the first variety, or deviation, from the last mentioned common sort.

G. *herbaceum* is in general cultivation all over Bengal and Coromandel. It is reared about Dacca, and furnishes that exceedingly fine cotton wool employed in manufacturing the very delicate, beautiful muslins of that place. The Dacca variety differs from the common G. *herbaceum* in the following respects.

1*st.* In the plant being more erect, with fewer branches, and the lobes of the leaves more pointed.

2*nd.* In the whole plant being tinged of a reddish colour, even the petioles, and nerves of the leaves, and being less pubescent.

3*rd.* In having the peduncles which support the flowers longer, and the exterior margins of the petals tinged with red.

4*th.* In the staple of the cotton being longer, much finer, and softer.

III. These are the most obvious disagreements, but whether they will prove permanent I can-
185 not say at present. The most intelligent people of that country (Dacca) think the great difference lies in the spinning, and allow little for the influence of soil.

Berar Cotton, I call the second variety. It is in cultivation over the Berar country; and is from thence imported into the Circars, or Northern Provinces, by Sada, Balawansa, &c. to Yourma-goodum, in the Musulipatam district. With this cotton the fine Madras, more properly, Northern Circar long cloth is made.

It differs from the above-mentioned two sorts in the following respects.

1*st.* In growing to a greater size; in being more permanent, or living longer; and in having smooth and straight branches.

2*nd.* In having the leaflets of the exterior calyx more deeply divided, and the wool of a finer quality, than in the first variety.

China Cotton, I call the third variety. It has lately been introduced into Bengal, from China; where it is cultivated, and its wool reckoned 25 per cent. better than that of Surat. It differs from the former sorts.

1*st.* In being much smaller, with but very few, short, weak branches.

2*nd.* In being, so far as my experience yet goes, annual.

3*rd.* In having the leaflets of the exterior calyx entire, or nearly so.

Lamarck's G. *Indicum, (Encyl.* ii. *p.* 134,) is no doubt one of these varieties, and from him Willdenow has given it a place in his *Ed.* of the *Sp. Pl. vol.* iii. *p.* 803.

4. G. *religiosum. Willd.* iii. 805.

Perennial, diffuse. *Leaves* hairy, with five acute, triangular lobes. *Stipules* cordate, acuminate. *Leaflets* of the exterior calyx deeply laciniate, colour of the corol uniform yellow. *Capsules* from four to five-celled, oblong, much pointed. *Seed* free, clothed with firmly adher-
III. ing, short, tawny down, and long wool of the same colour.
186 Nankeen, or brown cotton, allied to G. *hirsutum.* This species has been introduced into Bengal under the name *Nankeen cotton*, but does not thrive so well as to make it profitable; the colour of the wool tawny, and very different from the colour of the cotton cloth commonly called Nankeen, which is no doubt dyed. This can scarcely be more than a variety of *hirsutum.*

Note. Since writing the foregoing, a small variety of this tawny cotton has been introduced into this garden from the province of Nankeen itself, but unfortunately it promises still less than the first, and the colour and quality of the wool is much the same.

5. G. *vitifolium. Willd.* iii. 804.

Sub-arboreous, dark purple, and hairy. *Leaves* three, sometimes five-lobed; *lobes* triangular, and acuminate. *Capsules* oblong; sides clothed with firmly adhering short, greenish gray down, under the long, fine, white wool.

Native place uncertain, but in the Botanic garden at Calcutta it grows to be a small, ramous tree, with all the tender parts highly coloured, and very hairy. This sort is in flower and seed the whole year, and though the wool or cotton is fine and large in the fibre, it does not promise advantage to the cultivator, on account of the scantiness of the crop.

6. G. *acuminatum. R.*

Sub-arboreous. *Leaves* from three to five-lobed; *lobes* oblong, tapering much, and very acute. *Calyx* deeply laciniate. *Stipules* linear-lanceolate. *Capsules* long-ovate, much pointed.

Seeds many, adhering firmly to each other, black, and free of every pubescence, except the long, white wool which is easily removed; said to be a native of the mountains to the north and westward of Bengal. Page Carey Ed.

I do not find that this species is ever cultivated. It is readily distinguished by its superior size, and large black seeds, which adhere firmly to each other. III.

7. G. *Barbadense. Willd.* iii. 806. 187

Shrubby. *Leaves* smooth, with five acute, short, broad lobes. *Leaflets* of the exterior calyx deeply laciniate, and the colour of the corol uniform, yellow. *Capsules* oblong, pointed. *Seeds* free, black, and without any other pubescence than the long, fine, white wool.

Bourbon Cotton is the name this species is known by amongst the English in the East Indies. It does not appear to be a native of India, but introduced from the Island of Bourbon, some twenty years ago; at what period it was introduced from the West Indies into that Island, is uncertain. It succeeds better in the more elevated, dryer, and less fertile soil of Coromandel, than in Bengal, where the plant grows to a great size, yields less cotton, and the cultivation is very generally relinquished, though there must be many situations near the mountains of our northern frontier where it would thrive.

8. G. *hirsutum. Willd.* iii. 805.

Shrubby, tender parts hairy. *Leaves* hairy, with from three to five, triangular, acute lobes. *Exterior calyx* laciniate. *Corol* uniform pale yellow. *Capsule* ovate, acute. *Seeds* free, clothed with firmly adhering green, or gray down, under the fine, long, white wool.

Xylon Americanum prestantissimum, semine virescente. *Thunb.* 101.

This green-seeded variety has only been of late introduced into India, where the cotton is much admired by the natives. Another variety very lately introduced into the Botanic garden by Mr. Hamilton of Philadelphia, has the wool of a coarser nature, and the down which covers the seeds under it of a dirty white, or ash-colour. This promises little or no benefit to India.

After a search of above thirty years, I have not been able to find more well defined species of this genus, than the first mentioned four and the sixth species, with their varieties, that can be called the natives of Asia. G. *Barbadense* and *hirsutum* being, as above-mentioned, natives of America, do not properly belong to this Flora. III. 188

KYDIA. R.

Calyx double, exterior from four to six-leaved, spreading. *Anthers* fascicled. *Stipules* three. *Capsules* three-celled, three-valved. *Seeds* solitary.

1. K. *calycina. R. Ind. pl. N.* 215.

Exterior calyx four-leaved, larger than the corol.

Hind. Choupultea.

Teling. Pandikee.

I have every reason to imagine this will form a new genus; its essential character being, I think, very distinct from any of those hitherto described; nor do I believe it was known to Dr. König, for I have never met with it but amongst the Circar mountains, where he never was.

It delights in such soil as is generally found on the banks of rivulets, water courses, &c. where it grows to be a tree of a middling size. Flowering time the cold season.

Trunk straight; *bark* ash-coloured. *Head* large, spreading, very ramous; *young shoots* covered with a brown mealy dust. *Leaves* alternate, petioled, broad-cordate more or less from three to five-angled, irregularly-dentate, from three to five-nerved; both sides downy; there are also small tufts of stellate hairs dispersed over both sides, together with a farinaceous dust; from three to six inches each way; on the middle nerve a little below the middle, and sometimes also on the two next to it is an oblong, hollow, yellow gland. *Petioles* round, from two to three inches long, covered with brown farina. *Panicles* terminal, large, globular, crowded, many-flowered. *Flowers* numerous, middle-sized, pure white, collected in small umbellets, many of which make a panicle. *Bractes* small, rust-coloured, downy. *Pedicels* filiform, round, about three quarters of an inch long, covered with brown, farinaceous powder. *Calyx* double; the *exterior* one constantly four-leaved, spreading. *Leaflets* oblong, obtuse, downy, striated; three times longer and larger than the inner calyx, permanent. The *interior* calyx one-leaved, campanulate, half five-cleft; mealy on the outside, and clothed with white short hairs on the inside. *Corol; petals* five, obliquely-obcordate, much longer than the interior calyx, but shorter than the exterior one, woolly at the base. *Filaments* five, exceedingly short, thick, coalesced below into a tube. *Anthers* twenty, four of them sessile, round the apex of each of the short filaments, oval, lobed, one-celled. *Germ* superior, conical. *Style,* length of the tube formed by the filaments, three-cleft; *divisions* recurved. *Stigmas* very large. *Capsule* small, somewhat three-lobed, hid in the inner calyx, covered with brown farina, and stellate rugosities, three-celled, three-valved, opening from the apex. *Seeds,* one in each cell, obtusely three-sided, brown, affixed to the bottom of the cell. III. 189

Note. I have found many of the flowers male. As yet I am unacquainted with the uses of this tree.

2. K. *fraterna. Roxb.*

Exterior calyx six-leaved, shorter than the corol.

Teling. Potree.

This is evidently a second species of the last described; it is also a native of the Circar mountains, where it grows to be a larger tree than the former. Flowering time the rainy season.

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Trunk straight; *bark* rust-coloured. *Leaves* as in *calycina*, even to the glands, and all the parts covered with farina in that species, are the same in this. *Panicles* terminal, composed of small umbellets as in the former species, but by no means so much crowded. *Flowers* and *bractes* the same. *Pedicels* shorter and thicker. *Calyx* double. The *exterior* one from five to six-leaved, or cleft to very near the base; *leaflets* oval, no longer than the interior perianth. The *inner* calyx as in the last species. *Filaments*, they are as long as the staminiferous tube itself, and spreading. *Anthers* as in the former species. *Style* the length of the staminiferous tube. *Stigmas* three-lobed, even with the mouth of the tube, three-cleft, and spreading as in the last.

I have not seen the ripe seed-vessel, but the structure and contents of the germ promise the same parts as that of the former species.

Note. The chief marks of specific distinction are in the exterior calyx, filaments, and pistillum.

Upon the supposition of this forming a new genus, I have ventured to give it to the above name, in memory of the late Colonel Robert Kyd, of Bengal, whose attachment to botany and horticulture induced him to retire from the high rank he held in the army, to have more leisure to attend to his favourite study, to the advancement of every object which had the good of his fellow-creatures in view, and to the establishment of the Honourable East India Company's Botanic garden at Calcutta, where he was particularly attentive to the introduction of useful plants, and to their being dispersed over every part of the world, for the good of mankind in general.

HIBISCUS. Schreb. gen. N. 1139.

Calyx double; the *exterior* one many-leaved. *Capsule* five-celled, five-valved. *Seeds* a few in each cell.

SECT. I. *Leaves entire, or slightly lobed, or angular.*

1 H. *populneus. Willd.* iii. 809.

Arboreous. *Leaves* broad-cordate, entire, smooth. *Exterior calyx* scarcely any; the *interior* one almost entire. *Capsules* oblate-spheroidal, and bristly. *Seeds* downy.

Teling. Gangaraya.

III. 191 *Tam.* Poris.

Beng. Poresh.

Bupariti. *Rheed. Mal.* i. *t.* 29.

Novella littorea. *Rumph. Amb.* ii. *t.* 74.

A native of India, and its Islands, chiefly near the sea, in flower and seed all the year.

2. H. *populneoides. R.*

Arboreous. *Leaves* cordate, long-pointed, waved, smooth, glands in the divisions of the nerves. *Capsules* with two tough integuments; *seeds* from one to three in each cell, mealy.

Gorda-chanda. the Sanscrit name.

Hind. and *Beng.* Poris-pippal.

Teling. Moonee-Gangaraya.

This species is much like the former, I have found it in a few of the gardens of the natives near Samulcota; it flowers during the wet and cold seasons.

Trunk straight, from fifteen to twenty-five feet to the branches, thicker than a man's body. *Branches* numerous, forming a large, oblong head. *Young shoots* covered with bronze-coloured scales. *Leaves* about the extremities of the branches, alternate, petioled, cordate, waved, leathery, entire, from five to seven-nerved, long-pointed, as in *Ficus religiosa;* both sides, but particularly the under one, covered with small, round, ash-coloured scales, with a dark spot in the middle of each; at the base, in the axill of each of the principal nerves, there is a gland, which is smooth, convex above, and a deep pit below. *Petioles* as in *populneus. Stipules* subulate. *Peduncles, bractes, flowers, calyx, corol, stamens, style,* and *stigmas* as in *populneus. Capsule,* external form as in *populneus,* but large, five-celled; *integument* double; the *exterior* one, which is fragile and composed of five valves, opens from the apex spontaneously when ripe, exposing the inner lamina, which are remarkably strong, tough, reticulated with fibres, and not opening without considerable force. *Seeds* from one to three in each cell, kidney-formed, covered with brown farina. III. 192

This species is immediately to be distinguished from *populneus* by the glands in the axills of the nerves of the leaves, their waved border and long points, and by the double integument of the capsule; the innermost of which requires force and a sharp knife to open it; whereas in *populneus* it is single, and can be easily broken by the pressure of the thumb and finger.

This tree will answer better for avenues, parks, &c. than *populneus,* because it is much higher to the branches, consequently gives a free circulation to the air.

When wounded there discharges the some yellow juice as in *populneus.*

As both these trees want the most essential character, the double calyx of *Hibiscus,* I should imagine they would, with more propriety, form a new genus.

3. H. *tiliaceus. Willd.* iii. 810.

Arboreous. *Leaves* round-cordate. *Flowers* terminal. *Exterior calyx* ten-toothed. *Capsules* shorter than the calyx, five-valved, each divisible, though not spontaneously, ten-celled. *Seed* reniform.

Novella, *Rumph. Amb.* ii. *t.* 73, is too bad a figure to be quoted; yet I doubt not but it was intended for this tree, and although our plants are uncommonly luxuriant, I never saw any of the leaves with the least tendency to a lateral lobe.

A native of the Moluccas. Flowers in the hot season in the Botanic garden, though more or less the whole year round. Page Carey Ed.

4. H. *tortuosus. R.*

Arboreous, with a crooked trunk, and variously bent, diffuse branches. *Leaves* round-cordate, crenulate, hoary underneath. *Stipules* and *bractes* ovate-lanceolate. *Flowers* terminal; *exterior calyx* eight or nine-cleft. *Capsules* ten-celled, five-valved; the length of the inner calyx. III. 193

Bala, the Sanscrit name.

Beng. Bola.

Pariti. *Rheed. Mal.* i. *t.* 30.

Novella repens. *Rumph. Amb.* ii. *p.* 222.

Hibiscus *tiliaceus. Lour. Cochin Ch. p.* 509.

A native of most parts of India; found chiefly near the sea, and on the banks of large rivers, at no great distance from it; growing to be a tree of considerable size, with a stout, crooked trunk, or rather, like an immense bush, with numerous, very crooked branches, spreading wide, close to the ground. Flowering time in Bengal the hot season, viz. March, April, and May; the seed ripens three or four months afterwards. *Leaves* alternate, petioled, round-cordate, pointed, minutely crenulate, smooth above, hoary underneath; about four inches each way. *Petioles* an inch, or an inch and a half long, round, downy. *Stipules* opposite, obliquely oblong. *Peduncles* terminal, and from the exterior axills, two or three-flowered. *Pedicels* clavate, downy. *Flowers* large, campanulate, drooping, of a bright yellow, with the inside of the bottom of the bell, dark crimson. *Bractes* opposite, obliquely oblong, very downy, caducous. *Calyx*; the *exterior* one deeply divided into seven, or ten lanceolate-conic segments; the *inner* one twin, the length of the exterior one; five-cleft, each division has a glandular protuberance. In the Molucca plant, which has been blended with this, as one species, the exterior calyx is ten-toothed, and about one third or one fourth the length of the inner calyx, both are downy, and permanent. *Germ* ovate, villous; ten-celled, each cell containing from five to eight ovula, attached to the inner angle of the cell. *Stigma* five-lobed, clothed with clammy, dark crimson filaments, with glandular heads. *Capsule* the length of the inner calyx, ovate, acute, densely clothed with stellate pubescence, of the size of a nutmeg, ten-celled, five-valved; that is, they open spontaneously into five, but may be split into ten, the partitions are all double; five of them stronger, and rising from the middle of the five valves. *Seeds*, generally two, three, or four ripen, obovate-reniform, attached as in the germ. *Integuments* two in the fresh seed. *Perisperm* thin, of a dull white. *Embryo* curved, green. *Cotyledons* folded. *Radicle* curved, pointing directly to the umbilicus. The fibres of the bark may be employed as a very tolerable substitute for hemp. III. 194

5. H. *setosus. R.*

Leaves deeply cordate, crenulate, acute, downy underneath. Tender parts thickly clothed with very long, stellate bristles. *Flowers* axillary. *Exterior calyx* ten-cleft. *Capsule* ovate, acute. *Seeds* very hairy.

A native of Prince of Wales' Island, Chittagong, &c.

6. H. *Rosa-sinensis. Willd.* iii. 812.

Shrubby. *Leaves* ovate-cordate, grossly-serrate, lucid. *Stipules* ensiform. *Flowers* axillary. *Exterior calyx* of from six to eight linear leaflets.

Juva, the Sanscrit name.

Beng. Joba, Juva, Oroo.

Shoe-flower of the English, because the flowers are frequently used for blacking shoes.

Schem pariti. *Rheed. Mal.* ii. *t.* 17.

Flos festalis. *Rumph. Amb.* iv. *t.* 8.

Of this beautiful shrub there are several varieties, viz. single and double red, single and double yellow, and white. I have only found it in a cultivated state, however the single sort is found wild in the interior parts of Hindoostan.

It continues in flower the greatest part of the year in our gardens.

7. H. *phœniceus. Willd.* iii. *p.* 318.

Shrubby. *Leaves* cordate-serrate, acute, villous. *Stipules* subulate. *Peduncles* axillary, solitary, one-flowered. *Exterior calyx* from five to six-leaved. *Anthers* in verticels. *Capsules* globular. *Seeds* woolly. There is a variety with pure white flowers. III. 195

Beng. Lall Sooryumuni, the red-flowered variety. Shwet Sooryumu, the white-flowered one.

Teling. Yerra-salla-burta, the red variety; and Tella the white.

Sjasmin. *Rheed. Mal.* x. *p.* 1. *t.* 1.

Found in most parts of India. Flowers chiefly during the rainy season, though more or less the whole year.

8. H. *fragrans. R.*

Arboreous, tender parts hairy. *Leaves* cordate, serrate. *Flowers* axillary and terminal. *Calyces* equal, and both equally five-cleft.

Kinurlar the vernacular name in the Silhet district, where it is indigenous, growing to be a small tree, producing, during the cool months of December and January, a profusion of large, white, fragrant flowers; the seeds ripen in two or three months after.

9. H. *syriacus. Willd.* iii. 818.

Shrubby, straight. *Leaves* rhombiform, with the anterior margins grossly crenate, often sub-lobate, tolerably smooth. *Stipules* filiform. *Flowers* axillary, short-peduncled. *Exterior calyx* of from six to eight subulate leaflets.

Page Carey Ed.

H. *rhombifolius. Cavan.* and *Willd.* iii. 818.

Like H. *Rosa-sinensis*, there are many varieties of the plant cultivated in India. I have not yet found it in its wild state. The leaves vary from rhomboidal to three-lobed. I have therefore little doubt of H. *rhombifolius* of Willdenow and Cavanilles being the same.

10. *rigidus. Willd.* iii. 815.

III. 196 Shrubby, rigid, straight, scabrous, thin of branches. *Leaves* from round to ovate-lanceolate, serrate, scabrous. *Stipules* minute, subulate. *Peduncles* axillary, diverging, longer than the leaves. *Petals* totally reflexed. *Anthers* verticelled. *Capsules* round. *Seeds* woolly.

Teling. Salla-Burta.

A native of Coromandel. Flowers during the rainy season.

I am strongly inclined to think H. *hirtus* and *micranthus*, are nothing more than accidental varieties of this plant; soil and situation make it vary exceedingly.

11. H. *tubulosus. Willd.* iii. 828.

Annual, very hairy. *Leaves* cordate, serrate, the lower ones five-angled, hairy. *Flowers* short-peduncled, axillary, erect. *Capsules* ovate. *Stipules* often triple.

A large annual, a native of the Circar mountains. Flowers during the rainy and cold seasons.

Stem erect, ramous, round, from two to three feet high, clothed with many, stiff, straight, furcate hairs. *Leaves* petioled, cordate; the large or inferior ones are often five-angled, all are somewhat pointed, grossly dentate-serrate, downy and glutinous on both sides; from two to five inches each way. *Petioles* nearly as long as the leaves, round, and armed with hairs like the stem and branches. *Stipules* single, double, or triple, filiform, hairy, falling. *Peduncles* axillary, solitary, short, erect, rigid, one-flowered. *Exterior calyx* from seven to ten-leaved, erect, spatulate. *Filaments* few. *Capsule* oval, nearly hid by the inner calyx. *Seeds* numerous, brown, downy.

12. H. *pruriens. R.*

Perennial, hairy. *Leaves* cordate, acute, from three to five-angled, serrate. *Flowers* short-peduncled, axillary, and in terminal racemes. *Capsules* pointed, hairy. It is a very large, seemingly perennial species, a native of the mountainous parts of the country. Flowers during

III. 197 the cold season.

Stem erect, short, as thick as the wrist, woody. *Branches* numerous, ascending; *young parts* covered with very rigid hairs; the height of the plants raised in my garden, were from six to twelve feet. *Leaves* alternate, horizontal, petioled, cordate, from three to five-angled, from three to five-nerved, serrate, from three to six inches long, and from two to five broad. *Petioles* the length of the leaves. *Stipules* subulate. *Flowers* single from the exterior axills, and on long terminal racemes, short-pedicelled, in the flowering time beautifully bowing, very large, yellow, with a dark purple bottom. *Bractes* to the flowers on the racemes three-fold, awled. *Calyx*, exterior from five to seven-leaved; *leaves* linear, hairy, permanent. *Corol* campanulate, &c. as in *populneus. Capsule* oblong, erect, sharp-pointed, covered with strong hairs, which stick in the skin, and produce much itching. *Seeds* many, kidney-formed.

13. H. *Solandra. L' Herit. Stirp.* i. *t.* 49.

Annual, erect, ramous, clothed with hamose pubescence. *Leaves* cordate, rarely cordate-lobate, grossly serrate. *Stipules* and *bractes* clavate. *Racemes* terminal, elongated. *Pedicels* very long. *Exterior calyx* minute, or wanting.

Laganaea lobata. *Willd.* iii. *p.* 733.

Triquera acerifolia. *Cavan. Diss.* i. *t.* 11.

A native of Mysore. Flowers during the rainy season in the Botanic garden at Calcutta.

14. H. *Lampas. Willd.* iii. 811.

Sub-arboreous. *Leaves* from cordate and entire to three-lobed. *Stipules* subulate. *Flowers* sub-terminal, forming large, leafy panicles. *Exterior calyx* of from four to eight small, subulate, caducous leaflets. *Capsule* ovate.

A native of the Rajemahl hills and Chittagong. It was also found by Dr. Buchanan in Nepal. Flowering time the close of the rains; *seed* ripens in January.

III. 198 *Stems* in general several from the same root, with several, sub-erect branches, particularly near the top; *young parts* clothed with much stellate down. *Leaves* alternate, petioled, from sub-rotund, with the anterior margin, three-lobed on the young plants, to cordate and entire on the old; above pretty smooth, but hairy with stellate down underneath; from three to seven-nerved, with a gland on the base of the middle one only; length and breadth from two to six inches each way. *Petioles* round, ferruginous. *Stipules* subulate, caducous. *Flowers* campanulate, very large, of a bright yellow, with a very deep crimson bottom, short-pedicelled, and disposed two, three, or four alternately, on small entire, leaf-bearing branchlets, which issue from the exterior axills of the larger branches, forming a large leafy panicle. *Bractes* caducous, small, and rarely to be seen. *Calyx; exterior* of an uncertain number of small subulate, caducous leaflets; *inner* five-parted; *divisions* with subulate points. *Capsule* ovate, villous, of the size of a nutmeg. *Seeds* numerous. The young trees are now plentiful in the Botanic garden at Calcutta and very ornamental; the flowers being large, and the colour (yellow and crimson) particularly bright.

15. H. *tetralocularis. R.*

Sub-arboreous. *Leaves* cordate, three-lobed on the anterior margin, mealy. *Peduncles* axillary, bearing from one to four or more alternate flowers. *Exterior calyx* of three or four minute, caducous leaflets; the *inner* one truncated, with five remote, subulate segments. *Capsules* four-celled.

Teling. Condapatti.

Found on the hills of Coromandel, and is allied to H. *Lampas*, which grows on the hills of Rajemahl and on the banks of the Ganges; but differs from it in having a four-celled capsule. Flowering time, the rainy and cold seasons. Page Carey Ed.

16. H. *collinus. R.*

Arboreous. *Leaves* cordate, three-lobed, repand, smooth. *Exterior calyx* of from eight to ten lanceolate, waved, permanent leaflets. *Capsules* oblate, very hairy, and lined with pungent bristles. III. 199

Teling. Kanda-gang.

A native of the mountainous parts of the Circars, where the natives use the bark as a substitute for hemp. Flowering time the rainy season.

Stem arborescent. *Branches* ascending. *Leaves* alternate, petioled, slightly three-lobed, from three to five-nerved, scollopped, waved, sometimes toothed, smooth. *Petioles* round, rather shorter than the leaves. *Stipules* bristle-like, falling. *Peduncles* solitary from the axills of the exterior leaves and terminal, as long as the petioles, round, one-flowered, articulated near the apex. *Flowers* large, rose-coloured, with a dark purple centre. *Calyx; exterior* from eight to ten-leaved; *leaflets* erect, lanceolate, pointed; *margins* waved and reflexed. *Corol* flat. *Filaments* collected in verticels round their tube. *Capsule* roundish, a little oblate, five-ribbed, covered with much strong, gray, burning hair; the sutures on the inside are also thickly lined with stiff hairs.

The mountaineers use the bark of this species for cordage. I have often observed that the bark of most of the Indian plants of this class, particularly of this family, might be employed for the same purposes as hemp. It almost always peels off in very long slips, and is very tough, that of *Abroma augusta* is particularly so, and is of the same natural order.

In India I have also often observed with admiration, that those flowers with pistils longer than the stamens, and that are not naturally pendulous, stand in an oblique, or nearly perpendicular direction; this obliquity is further assisted by the curvature of their pistils, which together with the oblique direction of the flower, generally bring their stigmas immediately below the anthers. This structure is most conspicuous in the flowers of those plants belonging to the natural order *Columnifera*, and is certainly a strong argument in favour of the *Sexual System.*

17. H. *vitifolius. Willd.* iii. 829. III. 200

Annual, or biennial, bushy and villous. *Leaves* five-angled, lobed, grossly serrate, villous. *Flowers* axillary, solitary, drooping. *Exterior calyx* of about eight subulate leaves. *Capsules* five-winged, truncate.

Bharadwaja, the Sanscrit name.

Katu beloeren. *Rheed. Mal.* vi. *t.* 46.

Beng. Bun Kapash.

A native of rubbish, gardens, &c. all over India; in flower during the rainy and cold seasons.

18. H. *truncatus. R.*

Annual, erect. *Leaves* from three to five-angled, lobed, grossly serrate. *Stipules* minute. *Flowers* axillary, solitary, drooping. *Peduncles* jointed at the base. *Exterior calyx* of from six to seven, subulate leaves, half the length of the inner calyx. *Corol* sub-rotate, with petals standing distinct. *Capsule* truncated with five thin ciliate wings.

A native of Ceylon. Flowers in the rainy season in Bengal.

This plant, growing in the same place with H. *vitifolius*, which it most resembles, does not arrive to one tenth the size. The flowers are also much smaller. Both must be handled with care, as the small, sharp bristles readily enter the skin, and cause considerable uneasiness.

19. H. *scandens. R.*

Shrubby, scandent, villous. *Leaves* round-cordate, serrate-dentate, from three to five-angled. *Stipules* none. *Panicles* terminal, ramifications thereof remote, and diverging; both *calyces* five-parted.

A stout, permanent plant, a native of the forests of Chittagong, where it runs over trees &c. It blossoms in April and May. The flowers are numerous, large, campanulate, yellow, with crimson bottom.

20. H. *mutabilis. Willd.* iii. 817. III. 201

Arboreous. *Leaves* cordate, somewhat crenate, five-angled, downy. *Flowers* axillary, long-peduncled. *Exterior calyx* eight-leaved, half the length of the inner. *Capsules* globular, very hairy.

Padmucharinee, the Sanscrit name.

Hina paretti. *Rheed. Mal.* vi. *t.* 38—42.

Beng. Thul-pudma.

A native of China; both double and single are now common in gardens all over India. When the flowers first open in the morning they are nearly white; by night, a pretty deep red.

21. H. *cancellatus. R.**

Annual, erect, every part hairy and bristly; *leaves* cordate, more or less angled, crenate. *Stipules* subulate. *Racemes* terminate. *Exterior calyx* of about fifteen long incurved filiform leaflets; *inner* spathiform; *capsule* ovate.

From Nepal Dr. Buchanan sent the seed to the Botanic garden, where the plants blossom during the rainy season.

* H. *cucullatus*, *Suppl.* 311. Cavanilles and Willdenow consider this a species of *Paronia* viz. P. *cancellata*. See *Willd. sp. pl.* 583.

Page Carey Ed. *Root* annual. *Stem* straight, with but few sub-erect, round branches, clothed with much long hair intermixed with stiff sharp bristles; height of our plants about three feet. *Leaves* petioled, cordate, generally more or less angular, crenate, very hairy; from four to six inches long, and from three to five broad. *Petioles* horizontal, nearly as long as the leaves, round, and like every other part of the plant, very hairy. *Stipules* subulate, very long and very hairy. *Flowers* numerous, peduncled, drooping, solitary in the superior axills, and on a pretty long straight, terminal raceme, large, campanulate, of a lively yellow, with the bottom of the bell
III. crimson. *Bractes* like the stipules. *Calyx;* the *exterior* one as it were inflated, and composed
202 of from ten to eighteen or twenty long, filiform, incurved, hairy permanent leaflets; the *inner* one spathiform. *Capsule* ovate, length of the exterior calyx, five furlowed, very hairy, five-celled, five-valved. *Seeds* numerous, reniform, black.

22. H. *Abelmoschus. Willd.* iii. 826.

Annual, erect, hairy. *Leaves* serrate, hairy; the *inferior* ones from five to seven-angled, lobed; the *superior* ones sub-palmate. The *inner calyx* spathiform; the *exterior* one about ten-leaved.

Hind. Kustooree, or Kalla-kustooree.

Cutta-gasturi. *Rheed. Mal.* ii. *t.* 38.

A native of various parts of India. Flowering time the rainy and cold seasons.

23. H. *tricuspis. Willd.* iii. 830.

Arboreous, long-petioled, three-lobed, entire or crenate-dentate, pubescent, about five-nerved, with a long gland on the middle one, near the base. *Stipules* and *branches* large, semi-cordate. *Racemes* terminal, few-flowered, both calyces ten-parted. *Capsule* with five double cells.

From Otaheite the seeds were sent by the Missionaries to the Botanic garden at Calcuttta, where in two or three years, the plants they produced were ten or twelve feet high, with a perfectly straight trunk to the very top, amply decorated with long, spreading branches down to the ground. All the tender parts rather sparingly clothed with whitish stellate hairs, on the base of the middle nerve is a long gland underneath; the leaves next the flowers are generally entire, and lanceolar, all are obtuse pointed, even the lobes. The inner calyx in this species is strongly marked by having ten segments, they are alternately smaller, and the capsule is ten-celled, or rather has five double cells, as in Gærtner's H. *tiliaceus*, the flowers are
III. large, bright yellow, with a deep purple coloured bottom; they appear during the cold season
203 and are very ornamental; the seed ripens early in the hot season.

24. H. *hirtus. Buch.*

Annual, erect, very hairy. *Leaves* from cordate-lobate to hastate-palmate, and finally simple and linear. *Racemes* terminal. *Exterior calyx* ten-leaved; the *inner* one spathiform. *Capsule* ovate, hairy.

Alcea moschata villosissima. *Pluk. Alm. t.* 127. *f.* 1.

A native of Mysore, from thence the seeds were sent by Dr. Buchanan to the Botanic garden where it blossoms about the close of the rains.

Root annual, ramous. *Stem* erect, with several spreading branches near the ground, all are round and very hairy, height of the whole plant about two feet. *Leaves* alternate, petioled; *shape* very various; the lower ones being from simple to from five to seven-lobed, about the middle of the plant hastate, or deeply three-lobed, while those near the top amongst the flowers are small, linear, and nearly entire; all but those among the flowers deeply serrate, and very hairy. *Petioles* nearly as long as the leaves. *Stipules* subulate, incurved, and like the rest of the plant hairy. *Racemes* terminal, solitary. *Flowers* large, yellow, with a red bottom. *Bractes* like stipules. *Calyx;* the *exterior* one about ten-leaved, permanent; the *inner* one spathiform, dropping with the corol. *Capsule* ovate, five-angled, very hairy. *Seeds* numerous.

This species comes nearer H. *Abelmoschus*, particularly in the pubescence, flower and pericarp, than any other I know.

25. H. *pumilus. Roxb.*

Annual, erect, downy. *Leaves* serrate; the *inferior* ones cordate, the middle ones three-lobed; the *superior* ones lanceolate. *Exterior calyx minute. Stigmas* hairy. *Capsule* shorter than the inner calyx.

III. Solandra *lobata. Nu. Syst. Veget.* 623.
204 This is rather a rare plant on the Coromandel coast, a native of the borders of cultivated land; appearing and flowering in the wet and cold seasons.

Root ramous, annual. *Stem* erect, a little flexuose, round, downy, from two to four feet high. *Branches* few, near the ground ascending, stem-like. *Leaves* alternate, petioled, the lower ones, both on the stem and branches, cordate; the upper ones generally three-lobed, in luxuriant plants the lobes are separated to the base, and sometimes the lateral lobes are two-cleft; again those toward the summit of the plant are simply linear, the whole are acute, serrate and downy, with sometimes a few hairs; size very various. *Petioles* from one to two inches long, round, hairy. *Stipules* linear-lanceolate, in very luxuriant plants they are sometimes double or two-cleft. *Peduncles* axillary, single, erect, the length of the petioles, round, articulated above the middle, a little hairy, one-flowered. *Flowers* white, about the size of a shilling, open all day. *Calyx* minute, from six to nine-parted; the *interior* one five-cleft. *Corol; petals* obliquely-obcordate. *Filaments* numerous, short, the tube bending to one side, so as to make the stigmas below the anthers. *Style* five-cleft. *Stigmas* covered with hair, or globular leaflets. *Capsule* five-celled, five-valved, not in any respect wreathed, but just as in the genus. *Seeds* many, two rows in each cell.

26. H. *furcatus. R.* Page Carey Ed.

Shrubby, very ramous, armed with sharp thorny bristles arising from coloured, glandular tubercuti. *Leaves* from entire to three-parted, grossly serrate, and hairy. *Stipules* falcate, lanceolate. *Peduncles* solitary, axillary, one-flowered; *exterior calyx* of ten forked leaflets. *Capsule* hairy, ovate, acute.

Discovered by the Rev. Dr. Carey, indigenous in the interior parts of Bengal. The seed sent by him to the Botanic garden in one year produced plants that were six or eight feet high, and blossomed during the rainy season.

III. 205

Stems erect, somewhat ligneous. *Branches* numerous, expanding, armed with numerous stiff, acute, spinous, recurved bristles, issuing from small, coloured, glandular papilli; amongst the bristles, soft hairs are intermixed. *Leaves* from cordate below, to three and even five-lobed about the middle of the plant; and again near the top narrow-cordate; all are serrate and hairy; the size very various. *Petioles* almost as long as the leaves, and armed like the branches. *Stipules* falcate, lanceolate; *margins* ciliate. *Peduncles* axillary, solitary, one-flowered, shorter than the petioles, and like them armed with the same sharp bristles. *Flowers* large, yellow, with a dark crimson bottom. *Calyx* the *exterior* one about two-leaved, each leaflet enlarged beyond the middle; from the base of the enlargement on the upper side, issues a clavate, erect, or incurved segments; these form a cancellated dome over the inner, five-parted, rigid, glandular, bristly, hairy calyx; while the exterior broader, but shorter segments spread out horizontally. *Capsule* very hairy on the outside. *Seeds* few, from two to four in each cell.

I consider this to be *bifurcatus. Linn. Sp. Pl. ed. Willd.* iii. 819. until I reared that very plant, from seed received from the Island of Trinidad; the shrubs are nearly of the same size, but in that species every part is less hairy, the coloured glandular base of the bristles are not to be found; the *stipules* simply setaceous, and the flowers rose-coloured; consequently I must consider this a well marked distinct species, though nearly allied in the shape of the leaves and exterior calyx. Like many of the other plants of the natural order, *Columnifera* of Linnæus, or *Malvacea* of Jussieu, the bark of this species of *Hibiscus*, yields abundance of strong, white, flaxen fibres; but the prickliness of the plant renders it very troublesome to handle.

27. H. *Surattensis. Willd.* iii. 824.

Somewhat shrubby, weak and straggling, prickly. *Leaves* from entire to palmate, serrate. *Stipules* ear-shaped. *Exterior calyx* of from ten to twelve appendicled, permanent leaflets. *Flowers* axillary. *Capsules* acute, hairy on the outside.

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H. *Surattensis. Lour. Cochin Ch.* 512.

Herba crinalium. *Rumph. Amb.* iv. *t.* 16. appears to me to be this plant.

Narinam-poulli. *Rheed. Mal.* vi. *p.* 75. *t.* 4. agrees better with a very distinct species, (viz. *aculeata*) formerly described by me under the idea of its being *Surattensis*. At that time I had not seen the real Linnæan species, which is now before me, otherwise the mistake would not have happened. The stipules are the best marks to know them by.

A native of various parts of India. Flowers during the rainy and cold seasons in the Botanic garden.

28. H. *aculeatus. Roxb.*

Annual, erect, very prickly. *Leaves* palmate, three-lobed. *Lobes* remotely serrate. *Stipules* lanceolate. *Peduncles* axillary, solitary, one-flowered. *Exterior calyx* ten-leaved, appendaged.

I have only observed this in my garden, where it must have been brought from some other place amongst other seeds. It has proved annual with me.

Stem erect, very prickly, from two to five feet high, round, flexuose. *Leaves* remote, alternate, petioled, from entire to five-lobed, serrate, a little hairy; *lobes* lanceolate, pointed, principal nerves prickly on the under side. *Petioles* longer than the leaves, round, prickly. *Stipules* lanceolate, ciliate. *Peduncles* axillary, single, shorter than the petioles, prickly, one-flowered. *Flowers* large, campanulate, yellow, with a dark, purple bottom. *Calyx; exterior* articulated below the middle, and there enlarged on the outside with an oval leafy appendage below the articulation, horizontal from it, erect and incurved, covered with strong, straight, sharp bristles.

29. H. *strictus. R.*

Annual, straight, polished. *Leaves* palmate, lobate; *lobes* sub-rotund, acutely serrate, dentate. *Flowers* racemed, pure white throughout. *Exterior calyx* caducous; *inner* spathiform. *Capsule* linear-oblong.

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Of what country this plant is a native, I have not yet been able to ascertain. It made its appearance in the Botanic garden in 1798, when many chests of plants were brought into it from the Moluccas; and I think it is more than probable, the seed came accidently amongst the earth of those plants. Be this is may, the plant thrives luxuriantly with little or no care; seed-time, the beginning of the rains; it is in blossom about their termination, and the seed ripens in December and January, soon after which the plants perish. Since writing the above, Dr. J. Glass found it wild on the Rajmahl hills.

Root annual, ramous. *Stem* perfectly straight, with a few straight branches, when the plants stand single, or at a distance, otherwise simple. *Bark* pale green, and uncommonly smooth. Height of the whole plant from six to fourteen feet. *Leaves* alternate, petioled, reflexed, serrate, three, five, or seven-lobed; *lobes* of a roundish-obovate shape, smooth on both sides; size very various. *Petioles* as long as the leaves, sometimes most slightly armed with minute prickles, otherwise they are very smooth. *Stipules* filiform, caducous. *Flowers* short-pedunculed, solitary in the exterior axills, and on long, curved, terminal racemes, they are pretty

Page Carey Ed. large, and white in every part. *Calyx; outer perianth* of five or six, small, subulate, villous, caducous leaflets, dropping long before the corol expands; the *inner* one spathiform, villous; *mouth* five-toothed, deciduous. *Corol* as in the genus. *Capsule* oblong, five-angled, villous, and hairy, both without and within; while green, covered with minute, pellucid, clammy drops. *Seeds* numerous, round, hairy, and of a dark blackish brown colour.

On the coast of Coromandel I have often seen a species, which I think agrees better with all the descriptions and figures of H. *ficulneus* that I have met with, than the above described, otherwise I might have taken it for that plant.

III. 208 Like many other of the malvaceous tribe, the bark of this species abounds in flaxen fibres; but in none have I found so large a quantity, equally beautiful, long, glossy, white, fine and strong, as in this. To these promising qualities may be added the luxuriant growth, and habit of the plant, rendering it an object deserving of every care and attention, at least until the real worth of the material is fairly ascertained.

From several years experience, I find the best season for sowing the seed in Bengal, is just when the first rains begin; which is generally in May, in beds; and when the plants are about six inches high, transplant them out in rows, about nine inches asunder, and about as much from each other in the rows. In 1801, I had forty square yards planted in this manner, which yielded thirty-three pounds weight of the naturally very clean fibres.

30. H. *prostratus. R.*

Annual, with little or no stem, but many, very long, procumbent, scarcely armed branches. *Leaves* from three to five-lobed; *lobes* obovate, serrate. *Stipules* subulate. *Racemes* terminal. *Flowers* white, with a rose-coloured bottom. *Exterior calyx* from five to six-leaved, caducous; the *inner* one spathiform. *Capsule* oval, villous.

A native of the Circars, where it blossoms during the cold season. Compare with Lamarck's H. *ficulneus*.

31. H. *diversifolius. Willd.* iii. 820.

Perennial, bushy, prickly. *Leaves* from sub-lobate to palmate, serrate. *Exterior calyx* from eight to nine-leaved, both are very bristly.

A native of the eastern coast of Africa, and Madagascar. In the Botanic garden at Calcutta, it blossoms and ripens its seed during the cold season.

III. 209 32. H. *cannabinus. Willd.* iii. *R. Corom. Pl.* ii. *N.* 190.

Annual, straight, nearly simple, slightly armed. *Leaves* serrate; the inferior cordate; towards the middle of the plant palmate, with lanceolate, acute lobes; at the top simply linear-lanceolate. *Stipules* subulate. *Flowers* axillary, short-peduncled. *Exterior calyx* of seven subulate leaves; the *inner* one bristly and glandular.

Beng. Mesta pat.

Hind. Puloo.

Teling. Gung-kura.

Native place uncertain. Cultivated during the rainy season. The leaves are used as a pot herb, and the bark for hemp.

33. H. *radiatus. Willd.* iii. 824.

Perennial, prickly. *Leaves* palmate; *lobes* lanceolate, serrate. *Stipules* ensiform. *Flowers* axillary. *Calyx* bristly, the *exterior* one of eight or ten, linear, sub-bifurcated divisions.

Native place uncertain, but it is common in gardens about Calcutta, where it blossoms during the cold season.

Stem short, scarcely ligneous, though existing two or three years. *Branches* numerous, spreading, and ascending, armed with small prickles; generally the length of the plant, from five to six feet. *Leaves* alternate, palmate, rarely simple; *lobes* generally five in young plants, in old ones fewer, and broader-lanceolate, deeply and acutely serrate; smooth on both sides, from four to five inches long, by one broad. *Petioles* armed, and nearly as long as the leaves. *Stipules* ensiform. *Flowers* axillary, solitary, short-peduncled, very large; the exterior two thirds of the petals yellow, and spreading horizontally; the inner third deep crimson, and formed into a bell. *Calyx;* the *exterior* one of from eight to ten narrow-linear, bristly segments, which like H. *furcatus* and *bifurcatus*, have each a small additional segment, growing from the disk a little within the apex; the *inner* calyx five-cleft, longer than the exterior bristly segments, three-ribbed, and rather without the large gland in the middle of each, as in H. *cannabinus*, and this is one of the best marks to distinguish them by.

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It is an elegant plant when in blossom, the flowers being amongst the largest of the genus and the colours bright.

34. H. *longifolius. Willd.* iii. 857.

Annual, bristly. *Leaves* palmate, serrate; *lobes* lanceolate. *Flowers* axillary, solitary. *Exterior calyx* of from eight to ten linear leaflets; the *interior* one spathiform. *Capsules* subcylindric. *Seeds* numerous.

Beng. Dharoos.

Teling. Bendee.

Hind. Ram toorai.

I have not found this plant wild. It is much cultivated throughout India, in the gardens of both natives and Europeans.

Root ramous, annual. *Stem* erect, ramous, from three to six feet high, round, towards the base somewhat ligneous, and in a good soil as thick as a man's wrist, tender parts covered with sharp bristles and often spotted with purplish specks. *Leaves* alternate, petioles the inferior ones only angular, about the middle of the plant palmate, while the superior ones are sub-digitate, with the divisions lanceolate-oblong, all are serrate, and somewhat bristly; the

general size of the whole leaf is from eight to twelve inches each way. *Petioles* round, bristly, as long as the leaves, generally more coloured then the stem, or branches. *Stipules* often paired. *Flowers* axillary, solitary, short-peduncled, very large, pale yellow, with a dark crimson bottom. *Calyx;* the *exterior* one from six to twelve-leaved; *leaflets* linear, bristly, caducous; the *interior* one spathiform, bursting on one side, of a remarkably soft texture. *Corol, stamens,* and *germ* as in the genus. *Stigmas* as many as the cells in the capsule. *Capsule* from six to twelve inches long, and about one in diameter, somewhat bristly, particularly the ridges, their number corresponding with that of the cell, and valves, viz. from five to eight, with a single row of round, smooth seeds in each cell. Page Carey Ed. III. 211

This is one of the best, if not the best of the esculent herbs of India; the plant is easily raised from seed, and produces abundance of fruit, the only part which is eaten. The whole plant, particularly the capsules, is replete with much mild mucilage, which I consider as highly nourishing as well as mucilaginous, and might no doubt be employed to advantage in all diseases requiring emollients and demulcents. Some tender branches placed in water for examination soon rendered it gelatinous, almost as much so as if the branches of *Pedalium murex* had been standing in it. Dr. Cullen observes that coughing is often caused by acrid vapour, rising from the lungs irritating the glottis, and its neighbourhood; that by besmearing these parts with demulcent matter, we often lessen the irritation and frequency of coughing. A mild, palatable, culinary preparation of the very young capsules of this plant, would, I think, stand as fair a chance to answer this intention as any thing I know, and at the same time prove a nourishing part of the diet.

The stigmas are replete with a very beautiful deep purple juice, which they communicate to paper, and which is tolerably durable.

H. *esculentus,* the West India *Okra* possesses virtues nearly similar, though I believe inferior; this I have also cultivated for many years in the Botanic garden, and it differs from this very conspicuously, both in the shape of the leaves and capsules.

35. H. *tetraphyllus. R.*

Annual, erect, ramous, hairy. *Leaves* palmate; *divisions* variously lobate, and acutely dentate. *Stipules* and *bractes* lanceolate. *Flowers* racemed. *Exterior calyx* four-leaved. *Capsules* linear-oblong, hairy. III.

A large, racemous, annual species, of from four to five feet high, found about Calcutta. 212
Flowering time, the wet and cold season.

Stem erect, armed with very stiff short hairs, as well as the branches. *Leaves* palmate, hairy, and scabrous; *lobes* variously lobed, and dentate. *Petioles* round, longer than the leaves. *Stipules* lanceolate. *Flowers* large, yellow, campanulate, nodding on long terminal racemes, and from the exterior axills. *Calyx,* the *exterior* one four-leaved. *Capsule* ovate-oblong, five-sided, armed with much very stiff hair.

36. H. *chinensis. R.*

Annual, erect, hairy. *Leaves* palmate; *segments* from three to seven, sub-lanceolar, obtusely serrate, and obtusely acuminate. *Flowers* axillary and terminal; the *exterior calyx* from six to eight-leaved; the *interior* one spathiform. *Capsules* oblong, five-angled, hairy.

From China it has been introduced into the Botanic garden where it flowers and ripens its seed during the rainy and cold season. It has the habit of *Abelmoschus;* but the leaves are much more divided, and though the capsules are exceedingly like those of that species, yet the seeds are smaller, and void of the musky scent.

37. H. *pentaphyllus. R.*

Annual, erect, nearly smooth. *Leaves* deeply palmate, sometimes hastate; *divisions* linear, near the apices dentate. *Stipules* ensiform. *Exterior calyx* five-leaved, permanent; the *inner* one spathiform and deciduous. *Capsule* linear-oblong, hairy.

Reared in the Botanic garden from seeds received from Mr. Kerr at Canton in China; here it blossoms during the latter part of the rains.

Root annual. *Trunk* straight and almost destitute of branches, pretty smooth, the thickness of a man's finger, and about six feet high. *Leaves* alternate, petioled, deeply palmate; in old plants young shoots are produced with the leaves less divided, even three-lobed; *divisions* linear, near their apices dentate, pretty smooth on both sides; length and breadth of the whole leaves, from six to eight inches. *Petioles* shorter than the leaves. *Stipules* ensiform. *Flowers* terminal, and solitary from the terminal axills, peduncled, large, drooping, yellow. *Calyx,* the *interior* one constantly of five, large, ovate, permanent leaflets; the *inner* one spathiform, a little hairy, deciduous. *Capsule* linear-oblong, when ripe five-seeded, hairy. III. 213

38. H. *pungens. R.*

Perennial, erect, ramous, every part armed with acute bristles. *Leaves* palmate; *division* linear-lanceolate, somewhat lobate, and deeply dentate-serrate. *Stipules* ensiform. *Racemes* terminal. *Exterior calyx* four-leaved, permanent. *Capsule* slender, acuminate, hairy, longer than the calyx.

From Nepal Dr. Buchanan sent the seeds to the Botanic garden, where the plants blossom about the close of the rains and in the cold season.

Stem erect, as thick as a walking cane, and often continuing for two or more years. *Branches* ascending, all are round, green, and densely clothed, as is every other part of the plant, with innumerable, diverging, strong, acute bristles; which enter the skin like spines. *Leaves* long-petioled, alternate, palmate; *lobes* linear-lanceolate, often lobate, and always deeply serrate-dentate; length and breadth of the whole leaf, from six to eight inches. *Stipules* broad-ensiform, or sub-lanceolate. *Racemes* terminal. *Flowers* drooping, rather short-pedicelled, large, deep yellow. *Bractes* like the stipules. *Calyx;* the *exterior* one of four, large, broad-ovate,

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permanent leaflets; the *inner* one five-toothed. *Capsule* of a long, thin, tapering, conical form, and much longer than the calyces.

39. H. *heterophyllus. Vent. Mah. p.* 103. *t.* 103.

Arboreous. *Trunk* straight, armed. *Leaves* from palmate on young plants, to simple on the old; all are linear-lanceolate, and serrate. *Flowers* axillary, solitary. *Exterior calyx* of about ten subulate, permanent leaflets; the *inner* one five-cleft. *Capsules* oval, hairy.

A native of New South Wales. Flowers during the hot season in the Botanic garden.

PAVONIA. Schreb. gen. N. 1140.

Calyx double; the *exterior* one many-leaved. *Stigmas* ten. *Capsules* five, two-valved, one-seeded.

1. P. *Zeylanica. Willd.* iii. 838.

Erect, ramous, clothed with clammy pubescence. *Leaves* deeply three-lobed; *lobes* lanceolate, and notched. *Stipules* subulate. *Peduncles* axillary. *Exterior calyx* of from eight to twelve subulate, hairy leaflets. *Stamina* fifteen.

Hibiscus *Zeylanicus. Linn. Flor. Zeyl.* 226. *Burm. Flor. Ind.* 153. *t.* 48. *f.* 3.

Alcea pentacoccos. *Pluk. Alm.* 13. *t.* 125. *f.* 3. good.

A native of Coromandel. Flowers during the rainy and cool seasons.

2. P. *odorata. Willd.* iii. 837.

Erect, ramous, covered with clammy pubescence. *Leaves* round-cordate, angle-lobed, dentate. *Peduncles* axillary. *Exterior calyx* from ten to twelve-leaved. *Stamina* fifteen.

Teling. Chittle-bunda.

A native of Coromandel. In the Botanic garden at Calcutta, it is in flower all the year.

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CLASS XVII.

DIADELPHIA TRIANDRIA.

TAMARINDUS. Schreb. gen. N. 1100.

Calyx four-leaved. *Corol* three-petalled, unilateral. *Legume* pulpy.

T. *indica. Willd.* iii. 577.

Balam-pulli. *Rheed. Mal.* i. *t.* 23.

Amlica. *Asiat. Res.* iv. 247.

Tintri, or Tintiree, are also Sanscrit names.

Beng. Tintiree, or Tintil, or Tentool.

Hind. Umli, Amli.

Chinta-chittoo of the Telingas.

This most magnificent tree is so common and so generally known, as to require little or no description. I however suspect our East India tree differs, probably specifically, from that of the West Indies; besides I have in view, the reducing of it to its proper place in the *Sexual System*, which I conceive to be in the Class *Diadelphia*, and not *Monadelphia*, as arranged by Schreber, Willdenow, &c. It possesses the natural classic character of the former in an eminent degree, and scarcely any part of the latter; should the single circumstance of the filaments being united in one body towards the bottom, constitute the essential mark, it would undoubtedly be a monadelphous plant, but we know that almost one half of the genera of this, (the 17th Class) have the stamens connected into one body towards their base; yet I do not know of any one who has attempted to remove such, or even to consider them as monadelphous. III. 216

Flowering time the hottest part of the year, which is generally in May. Fruit ripens during the cold season, or from December till February.

The tree is one of the largest in India, with a most extensive, large, shady head, or coma, the bark dark-coloured, and scabrous, the wood hard, very durable, and most beautifully veined.

Leaves pinnate. *Leaflets* from ten to fifteen pair, opposite, sub-sessile, tapering a little, entire, obtuse, smooth on both sides, the inferior pair larger. *Petioles* channelled, from four to six inches long. *Stipules* small, caducous. *Racemes* terminal, and lateral. *Bractes* obovate, coloured, one-flowered, caducous. *Calyx* four-leaved, cruciate, expanding, deciduous. *Corol* sub-papilionaceous, erect, unilateral, the length of the calyx. *Banner*, or middle petal oblong, *margins* involute and curled. *Wings* oval, margins curled, all three are beautifully variegated with red and yellow; *keel*, two short subulate petals, or filaments under the stamens; these were considered nectarial, and formed a part of the essential generic character. *Filaments* three, conjoined, inserted under the germ, ascending. *Anthers* incumbent. There are the rudiments of four more filaments in the fissures and outsides of the three fertile ones. *Germ* pedicelled, linear, with the style much incurved. *Legume* pendulous, nearly linear, generally curved, somewhat compressed, replete with firm, acid pulp, covered with a hard, scabrous bark, which never separates into valves; nor could I ever observe any suture indicating such a division; under the bark run three nervous fibres, one down the upper concave margin, and the other two at equal distances from the inferior, or convex edge. *Seeds* from six to twelve, somewhat trapeziform, compressed, covered with a smooth, hard, brown bark, and inserted into the in-

ferior, or convex side of the pericarp.

Extract of a letter from Captain (now Colonel) Pringle at Lucknow.

"Inclosed I beg leave to send you a specimen of the red Tamarind, which I believe is unknown in Bengal; at least I never saw it until I came to this part of the country.

"This Tamarind makes a very fine preserve, and yields a beautiful deep red colour, approaching to a purple."

The leaves are eaten in the curries of the natives, the pulp of the fruit is universally known. The seeds ground into a flour, are boiled into thick conjee, and used as an article of diet by the poor in times of scarcity or famine; of the same flour a tenacious paste is made, which serves for various economical uses.

The kernels of the Mango are large, and seem to contain much nourishment; however they are made no use of, except like those of the Tamarind, in times of scarcity and famine; they then are boiled in steam, and used as an article of diet.

DIADELPHIA HEXANDRIA.

FUMARIA. Schreb. gen. N. 1154.

Calyx two-leaved. *Corol* ringent. *Filaments* two, each bearing three anthers.

F. *parviflora. Willd.* iii. *p.* 868.

Annual, diffuse. *Leaves* super-decompound, with smooth, filiform divisions. *Flowers* racemed. *Stigma* bifid; *pericarp* round, with one round hard seed.

Beng. Bun Sulpa.

A native of Bengal, where it appears very common on cultivated lands in the vicinity of Calcutta, during the cold season. It has the habit of F. *officinalis* but in the Indian plant, the ultimate segments of the leaves are filiform and the stigma bifid.

DIADELPHIA OCTANDRIA.

POLYGALA. Schreb gen. N. 1154.

Calyx of five leaves, two of them large and coloured. *Legume* obcordate, two-celled.

1. P. *arvensis. Willd.* iii. 376.

Procumbent; *root* perennial. *Leaves* linear-lanceolate, hairy. *Racemes* axillary, solitary; *flowers* crested. *Seeds* hairy.

Hind. Meradoo.

A small, procumbent, triennial, or perennial plant, a native of pasture lands. Flowers during the rainy season.

Stem several, diffuse, with their extremities ascending, round, a little hairy, about a foot long. *Leaves* alternate, very short-petioled, linear-lanceolate, recurved, margins revolute, a little hairy, from one to twelve inches long, the inferior leaves are broader and shorter. *Racemes* solitary, axillary, or a little above, as long as the leaves. *Bractes* three-fold, one-flowered. *Flowers* small, orange-coloured. *Calyx* five-leaved, the three exterior ones small, the two interior, or lateral ones, formerly called the wings of the corol, large, all are oval and pointed. *Banner* two-petalled, or they may be called wings, and then there will be no banner, sub-erect, obovate. *Keel* bearded. *Stamens* in one body, dividing into eight filaments. *Germ* obcordate. *Style* long, projecting, thickening. *Stigma* large, clubbed, incurved. *Seeds* hairy.

2. P. *telephioides. Willd.* iii. 376.

Procumbent; *leaves* oval, smooth. *Racemes* scattered between the leaves; *flowers* crested. *Seed* very hairy.

This species differs from the last in the following points, for the plants are in size and appearance the same, but in this the leaves are smooth, and oval, or at most oblong, the racemes are scattered over the branchlets between the leaves, and not axillary, and the seeds are very hairy.

3. B. *undulata. R.*

Annual, ramous. *Leaves* alternate, ovate-cordate, much waved, from three to five-nerved. *Spikes* terminal; *flowers* crested. *Capsule* reniform, *margins* prickly.

A native of Prince of Wales' Island.

SECURIDACA. Schreb. gen. N. 1156.

Calyx three-leaved. *Corol* papilionaceous, with the banner two-leaved, without the wings. *Legume (capsule)* ovate, one-celled, one-seeded, ending in a ligulate wing.

S. *paniculata. R.*

Shrubby, scandent. *Leaves* oblong. *Panicle* terminal and axillary. *Flowers* crested, as in many of the *Polygalas.*

Ferinjer, the vernacular name in Silhet, where, as well as Chittagong, it is indigenous, growing to be a large, very ramous, bushy shrub. Flowering in August, and the seed ripening in April.

Stem stout and woody, covered with smooth, olive-coloured bark. *Branches* numerous, extremities drooping, round and smooth, even polished. *Leaves* alternate, bifarious, short-petioled, oblong, entire, acute, smooth on both sides, coloured, from three to four inches long,

Page Carey Ed. and from one to two broad. *Petioles* very short, and inserted on a brown, glandular receptacle, which has a pit on each side, and no other stipula. *Panicles* terminal with smaller ones from the exterior axills, large, ramous, open. *Flowers* numerous, but standing single, long-pedicelled, small, red. *Calyx* three-leaved. *Leaflets* ovate-oblong, one incumbent, and two under the flower laterally. *Corol* sub-papilionaceous, five-petalled, the two largest inserted on the sides, and from the banner, exterior; they are oval, and taper at the base, spreading out, and ascending; the interior three, two of them the wings, spatulate, and inverted on
III. the posterior sides of the boat-shaped, one-leaved, crested carina, all are curled on the mar-
220 gins and beautifully veined. *Filaments* eight in one body. *Anthers* oblong. *Germ* sessile, oval, protruded under the style, one-celled, and containing a single ovulum, attached to the apex of the cell. *Style* the length of the stamina, ascending. *Stigma* glandular. *Capsule* superior, from turbinate to oval, entire, one-celled, evalvular, ending in a very large substantial wing in the erect shape of a chopping-knife. *Seeds* solitary, oval, or somewhat obovate, attached to the top of the cell, and round the insertion partially arilled. *Integument* single, thin, and firmly attached to the embryo. *Perisperm* none. *Embryo* conform to the seed, inverse. *Cotyledons* of a softish, yellow, waxy consistence, and yellow colour. *Plumula* of two obtuse lobes. *Radicle* minute, superior.

DIADELPHIA DECANDRIA.

DALBERGIA. Schreb. gen. N. 1158.

Legume pedicelled, membranaceous, not opening spontaneously, but crumbling to pieces by age. *Seeds* one or more.

Note. The stamina disagree so much in the different species of this very natural family as to render their forming any part of the *essential generic character* inconvenient. The fruit alone appears to be sufficient, to which may be added the alternately pinnate leaves.

1. D. *Oojeinensis. Roxb.*

Leaves ternate; *leaflets* sub-rotund. *Racemes* terminal, and axillary. *Flowers* three-fold; *stamens* one and nine. *Legume* linear.

From seeds received in 1795 into the Botanic garden at Calcutta from Dr. William Hunter, the surgeon to the Resident at Oojein, two young trees have been reared. In March and April they blossom, when nearly destitute of leaves. The seed ripens in September and
III October.
221 *Trunk* tolerably straight, crowned with numerous spreading branches and branchlets, the height of the trees in fourteen years, thirty-five feet. *Bark* of the trunk dark brown, and deeply cracked, of the younger parts smoother. *Leaves* alternate, petioled, ternate, the whole length often extends to twelve inches. *Leaflets*, the exterior one nearly round, with an obtuse point, length about seven inches, and about six broad; lower pair obliquely ovate-cordate, obtuse-pointed; about four inches long, and three broad; *margins* of all scolloped, and much waved, of a firm texture, smooth above, and a little villous underneath. *Racemes* axillary, and terminal, rarely compound. *Pedicels* three-fold, slender, coloured, villous, one-flowered. *Bractes; common* of the pedicels, solitary, sub-reniform, small, villous, caducous; *proper* of the pedicels, solitary on the outside of the base of each; of the calyx, still smaller but oblong, and pressing upon it laterally. *Flowers* numerous, rather small, of a very pale rose-colour, indeed almost white, somewhat fragrant. *Calyx* sub-bilabiate; the *upper* division oblong, bidentate; the *under* one three-parted. *Corol* papilionaceous. *Banner* sub-rotund. *Stamina* a single one above, and below nine united. *Anthers* sub-rotund. *Germ* linear, with the rudiments of eight or nine seeds. *Style* short. *Stigma* headed. *Legume* linear-oblong, obtuse, veined, and villous on the outside. *Seeds* one, two or three, reniform, compressed.

The wood of this very large tree, Dr. Hunter informs me, is highly valued for various purposes.

The pillars of Madajee Scindia's palace, at Oojein, are made of it.

2. D. *latifolia. Willd.* iii. 902. *R. Corom. pl.* ii. *No.* 113.

Leaflets from three to seven, sub-alternate, roundish, emarginate. *Panicle* axillary. *Filaments* ten, coalesced into one body. *Legume* one-seeded.

Teling. Viroogoodu-charva.

Eng. Blackwood tree.

III. *Beng.* Sit-sal.
222 This is one of our largest mountain trees. Flowers during the wet season. The seeds ripen in February and March.

Trunk erect, though rarely straight, often very thick and rising to a very great height. *Branches* spreading, very numerous, forming a large, shady head. *Leaves* alternate, pinnate, with an odd one, from six to nine inches long; *leaflets* from three to seven, generally five, alternate, the exterior ones largest, roundish, emarginate, a little waved, above smooth, covered with a little whitish down underneath, generally about two inches each way. *Petioles* round, smooth. *Stipules* none. *Panicles* axillary, small, erect. *Flowers* small, white. *Calyx* hoary, five-toothed. *Filaments* ten, united into one, open above. *Anthers* twin, singly globular. *Germ* pedicelled, smooth. *Stigma* simple. *Legume* pedicelled, lanceolate, thin, brittle, when ripe crumbling away, not opening spontaneously, about an inch broad, and two and a half or more long. *Seed* generally but one in the centre of the legume, reniform, smooth, compressed, brown, of the size of a very small French bean.

The wood of the centre of the trunk and large branches of this tree, is what is commonly called black wood, and is almost universally used for making furniture; its colour is a greenish or greenish black, with lighter coloured veins running in various directions, which gives it that beautiful appearance, so much admired; it is rather heavy, sinking in water, close-grained, and admitting of the finest polish. On the Malabar coast this tree must grow to an immense size, as I have seen planks from thence, full three feet and a half broad, and if we allow nine inches of white wood to have been on the outside of these trees, the circumference must have been fifteen feet exclusive of the bark. Page Carey Ed.

In Bengal, where the tree is common, the wood is known by the name Sit-sal, and is certainly not so heavy as that on the coast of Coromandel and Malabar, though fully as beautiful, and very much used for furniture.

3. D. *Sissoo. Roxb.* III. 223

Leaflets about five, alternate, round, acute. *Panicles* axillary. *Filaments* nine, equally coalesced into one. *Legume* lanceolate.

Sans. Shingshupa.

Hind. and *Beng.* Sissoo.

A native of Bengal, and of the adjoining provinces to the northward. Flowering time the beginning of the hot season; the seed ripens about the close of the year.

Trunk generally more or less crooked, high and of great thickness, often from three to four feet in diameter. *Branches* numerous, spreading in every direction; *branchlets* bifarious. *Young shoots* downy and always drooping, even the leading one. *Bark* on young trees ash-coloured and pretty smooth, when old uncommonly thick, and very deeply cracked in every direction. *Leaves* alternate, bifarious, pinnate. *Leaflets* alternate, generally from three to five, sub-orbicular or obcordate, pointed, waved, when young downy, when old smooth and shining; from one to twelve inches each way, the inferior ones smallest. *Petioles* round, waved, very downy when young, smooth when old. *Stipules* lanceolate, caducous. *Panicle* axillary, downy, composed of numerous, short, sub-secund spikes. *Flowers* small, of a yellowish white. *Bractes* small, caducous. *Calyx* campanulate, hairy; the upper two divisions rounded, the under three acute. *Corol* as in the genus. *Filaments* nine, equally coalesced for two-thirds their length, thin, alternate, shorter with roundish anthers. *Germ* pedicelled. *Style* very short. *Stigma* large, glandular. *Legume* linear-lanceolate, membranaceous, three-seeded. *Seeds* compressed; reniform.

This tree yields the Bengal ship-builders their crooked timbers and knees. It is tolerably light, remarkably strong, but unfortunately not so durable as could be wished. It answers well for various other economical purposes; the colour, a light grayish brown, with darker coloured veins. Upon the whole I scarcely know any other tree that deserves more attention, III. for when its rapid growth in almost every soil, its beauty, and uses are taken into the account, few trees can be compared with it. 224

4. D. *emarginata. R.*

Leaflets from five to seven, alternate, round, obcordate, emarginate. *Panicle* axillary, and terminal. *Filaments* nine, coalesced in one. *Legume* linear-lanceolate, from two to four-seeded.

A native of the Andaman Islands, from thence introduced into the Botanic garden in 1760, by Colonel Alex. Kyd. In 1809, the largest of the trees was from forty to fifty feet high, and thick in proportion, viz. from forty to forty-five inches in circumference, four feet above the ground. They blossom in September; and the seed ripens in March, at which time the trees are destitute of leaves in Bengal.

Trunk nearly straight. *Bark* tolerably smooth and of a dirty gray colour. *Branches* numerous, spreading and dividing in every direction, so as to form one of our most shady trees. *Leaves* alternate, bifarious, pinnate, from six to eight inches long. *Leaflets* generally five or seven, sub-alternate, short-petioled, round-obcordate, emarginate, very smooth, and highly polished on both sides, but much paler underneath, general size about an inch each way for the lower ones, and an inch and a half for the most exterior ones. *Petioles* and *petiolets* round, slender and smooth. *Stipules* minute, caducous. *Panicles* axillary, and terminal, shorter than the leaves, ramifications alternate, bifarious, smooth. *Flowers* numerous, small, alternate, pedicelled, pure white, fragrant. *Calyx* smooth; *upper* two divisions broader, shorter and more united. *Filaments* nine, united into one body with a fissure down the back. *Anthers* twin. *Germ* linear-oblong, pedicelled. *Style* short. *Legume* lanceolate, with generally from one to three seeds.

In habit it much resembles *Dalbergia Sissoo*; the most conspicuous specific difference III. is in the leaves; in this they are emarginate, in that pointed; I may also add that the bark 225 in this is smooth, in that deeply cracked. Colonel Alexander Kyd, who brought the young tree from the Andaman Islands, in a letter dated October 1801, says, "I remember the trees perfectly well, I brought them from the Andamans. We there looked upon it as a kind of *Sissoo*, and it was by far the most valuable kind of wood we had on the Island, as it grew to a very large size, and was well suited for ship building. It has very much the appearance of *Sissoo* when cut, but is of a more uniform colour and rather darker; in fact, like very dark coloured oak. It grows in common on the high grounds, with wood oil, and red wood trees, and all the other varieties of trees that are at the Andamans, but seems by no means a very common tree. Captain Blair built a vessel at the Andamans called the Union, and employed as much of this timber on her as he could procure, but as this vessel is unfortunately gone to the bottom, there is no finding out whether it is a durable timber or not."

The timber of the young trees in the Botanic garden is considerably harder and closer in

Page Carey Ed. the grain, than that of *Sissoo* of the same size, and its growth much slower.

5. D. *alata. R.*

Arboreous. *Leaflets* about three pair, opposite, linear-oblong, polished. *Panicle* terminal. *Filaments* single and nine-cleft. *Legume* linear, with a short polished wing all round.

Found by Mr. William Roxburgh in the state of a small tree in the forests of Pulo Pinang.

6. D. *parviflora. R.*

Leaflets from three to four pair, alternate, broad-lanceolate, entire, smooth. *Panicles* terminal, corymbiform. *Bractes* round, ciliate. *Stamina* in one body. *Legume* falcate, one or two-seeded.

III. A native of the Moluccas, and by far the smallest flowered species I have yet found.

226 7. D. *reniformis. R.*

Tender parts ferruginous. *Leaflets* from five to eleven, alternate, lanceolate. *Panicles* axillary and lateral. *Stamina* in two five-cleft bodies; *legumes* reniform with thick, rounded margins.

Kures, the vernacular name in Silhet, where it is indigenous; grows to be a large, crooked, bushy tree, the wood yields a greenish flame, and is reckoned the best for burning the lime stone of that district. Flowering time March; and the seed ripens in December.

Young shoots, &c. tender parts densely clothed with a thick coat of ferruginous down. *Leaves* alternate, pinnate, about six or eight inches long. *Leaflets* generally from five to seven, or nine; rarely eleven, sub-alternate, short-petioled, lanceolate, entire, while young villous underneath, at all other times perfectly smooth, and of a firm texture; two inches long, and one broad. *Stipules* subulate, villous, caducous. *Panicles* axillary, and below the leaves, and generally shorter than them, very downy, composed of a few, many-flowered, simple branches. *Calyx* sub-campanulate, and like the panicle, clothed with ferruginous down. *Corol* as in the genus. *Stamina* in two, equal, five-cleft bodies. *Anthers* nearly round, two-lobed. *Germ* pedicelled, generally two or three-seeded. *Style* incurved. *Stigma* simple. *Legumes* generally of one reniform joint; and one-celled, compressed, but with thick rounded margins; about an inch long, and three quarters of an inch broad. When the legume has a second joint, it is like the anther. *Seed* solitary, reniform, &c. as in the order.

8. D. *frondosa. Roxb.*

Bark smooth. *Leaflets* about five pair, alternate, oval, emarginate. *Stipules* falcate.

III. *Panicles* axillary. *Stigma* in two equal bodies. *Legume* from two to three-seeded.

227 A native of Ceylon, and the Peninsula of India. In the Botanic garden the trees blossom in May and June, and the seed ripens in September and October.

Trunk erect, and in a tree only seven years old, three feet in circumference; the *bark* is particularly smooth, and light ash-coloured. *Branches* spreading, nearly horizontal, with numerous, alternate, bifarious branchlets, forming a large, dense crown; general height of the tree thirty feet to the top. *Leaves* alternate, bifarious, pinnate, from six to twelve inches long. *Leaflets* alternate, short-petiolated, about five on each side, oval, emarginate, smooth, about an inch or an inch and a half long, and one broad, deciduous during the cold season, and appearing with the flowers in May and June. *Stipules* lanceolate-falcate, caducous. *Panicle* axillary, solitary, shorter than the leaves, composed of a few alternate, bifarious, ascending, simple, secund, villous branches. *Flowers* pale blue, small, disposed in two approximate, unilateral rows on the convex or outside of the branches of the panicle. *Bractes* small, lanceolate, villous, caducous at a very early period, the largest one below each pedicel, and two pressing the calyx laterally. *Calyx* bilabiate; the *upper lip* bidentate; the *under* one tridentate, the middle one longer. *Filaments* in two, equal, five-cleft bodies. *Germ* pedicelled, one-celled, four-seeded. *Style* shorter than the germ, rising at a right angle from it, smooth. *Stigma* minute, smooth. *Legume* pedicelled, not opening, lanceolate, from one to four-celled, one or two most frequent. *Seeds* obliquely-reniform, compressed, smooth. *Perisperm* none, &c. as in other *Leguminosæ*.

It is a quick growing, large, beautiful tree, and the timber useful for many purposes.

9. D. *paniculata. Willd.* iii. 903. *Roxb. Corom. pl.* ii. *No.* 114.

Leaflets from five to six pair, alternate, obovate-oblong, emarginate. *Panicles* terminal, one or two-seeded.

III. Patsuroo is the Telinga name.

228 This is also a large tree, and a native of the same mountains as the preceding species. Flowers about the beginning of the hot season.

Trunk erect. *Bark* pretty smooth, of a light ash-colour. *Branches* numerous, spreading, forming a very fine, close, shady head. *Branchlets* ascending. *Leaves* alternate, bifarious, pinnate, with an odd one; from four to five inches long. *Leaflets* generally from three to five pair, alternate, oblong, smooth, often emarginate, nearly equal, about one inch and a half long, and about one broad. *Stipules* lanceolate, falcate. *Panicles* terminal, leafy, large, generally bifarious; ramifications alternate, round, downy. *Flowers* numerous, small, white, with a faint tinge of blue. *Calyx* of a deep blackish purple, and hairy. *Wings* as long as the banner. *Keel* half the length of the wings, two-petalled, only slightly united for a little way at the middle. *Filaments* two, lateral, equal, ascending, each divided into five. *Anthers* twin, singly globular. *Legume* lanceolar. *Seed* generally single.

Note. The wood of this tree is white, and firm to appearance, but less useful than some of the other species.

10. D. *zeylanica. R.*

Bark cracked. *Leaflets* six-paired, alternate, cuneate-oblong; emarginate. *Stipules* oblong. *Panicles* axillary. *Legume* lanceolar, from one to three-seeded.

Cing. Beloo-labba. Page Carey Ed.

A large, elegant timber tree, a native of Ceylon; from thence sent to the Botanic garden by General Hay Macdowall in 1801; where in six years, they began to blossom in May and June, and the seed ripened in September and October.

11. D. *ferruginea. Roxb.*

Leaflets from six to eight pair, alternate, oblong, emarginate. *Stipules* and *bractes* from broad obovate, to linearly cuneate. *Panicles* axillary. *Filaments* in two equal bodies. *Legume* lanceolate, from two to four-seeded. III. 229

A native of the Islands east of the Bay of Bengal. *Tender branchlets* clothed with ferruginous down. *Leaves* alternate, pinnate, from four to six inches long. *Leaflets* six or eight pair, alternate, sub-sessile, linear-oblong, emarginate, a little hairy, nearly one inch long, and scarcely half so much broad. *Stipules* broad obovate; *apex* almost premorse, downy. *Panicles* axillary, shorter than the leaves; *racemes* simple, secund, and ferruginous. *Bractes*, the larger one under each division of the panicle like the stipules; those of the flowers also solitary, one-flowered, and narrower; those of the calyx, one on each side, narrow-cuneate. *Flowers* numerous, small. *Calyx* hairy; *upper lip* of two rounded lobes; *lower* of three long, acute segments. *Filaments* ten, in two equal bodies. *Anthers* broadly two-lobed. *Germ* pedicelled, margins hairy. *Legume* lanceolate, from two to four-seeded.

12. D. *Krowee.*

Arboreous. *Leaflets* from ten to eighteen pair, sub-opposite, oblong. *Racemes* axillary, solitary. *Filaments* one and nine. *Legumes* linear, black, sharp, from four to eight-seeded.

Krowee, is the vernacular name in Silhet, where the tree is indigenous, and grows quickly to a large size, yielding timber of a dark brown colour, and rather too porous for furniture, but seems very fit for various other purposes. Flowering time April, seed ripens in December.

Trunk of considerable size, but generally crooked. *Bark* embossed with transverse protuberances on a smooth bright ash-coloured ground; inwardly very fibrous, but rather friable. *Wood* very firm and of a brownish gray colour. *Leaves* unequally pinnate, from six to ten inches long. *Leaflets* from five to twenty pairs; from opposite to alternate, those which first expand may be called the floral leaves, and have scarcely half the number of leaflets, which those have that unfold afterwards, oblong, or elliptic, obtuse, pretty smooth, from one to two inches long, and three-fourths of an inch broad. *Stipules* ensiform, clothed with ferruginous down. *Racemes* axillary, longer than the floral leaves. *Flowers* numerous, small, white, pretty long-pedicelled, from three to six, inserted on very short, alternate, common peduncles. *Bractes* small, ensiform, always two of them under the calyx. *Calyx* cup-shaped, villous, smooth, five-toothed. *Corol* as in the order. *Filaments* one and nine. *Germ* a short-pedicelled, semilunar body within the base of the nine conjoined filaments, linear, hairy, and containing from ten to fourteen ovula. *Style* ascending. *Stigma* smooth. *Legume* linear, from two to three inches long, and less than half an inch in breadth; *upper* margin sharp and distinctly defined by a strong rib, or nerve, to the inside of which the seeds are attached, thin and brittle, not opening. *Seeds* generally from four to eight, small, smooth, light brown, lenticular. III. 230

13. D. *marginata. Roxb.*

Scandent, scabrous. *Leaflets* five or seven, lanceolate, glossy, obtusely acuminate. *Panicle* axillary. *Stamina* one and nine. *Legumes* sub-linear, membrane-margined, one-seeded.

Mukree gilla, the vernacular name in Silhet, where it is indigenous; it blossoms in the rains, and the seed ripens during the hot season.

Stem woody, and with its numerous scabrous branches climbing and twining up and over trees, &c. *Leaves* alternate, unequally pinnate, from six to ten inches long. *Leaflets* two or three pair, and a terminal one, petiolate, lanceolate, entire, points long, narrow, and obtuse, of a firm texture and polished, from four to five inches long, and from one to two broad. *Panicles* axillary, length of the leaves, and its few remote branches spreading as much. *Flowers* remote, long, and slender-pedicelled, white. *Calyx* bowl-shaped, of a deep black purple; mouth obscurely five-toothed. *Banner* long-clawed, obcordate. *Wings* and *keel* long and slender-pedicelled, white. *Filaments* one and nine. *Germ* linear, smooth, three-seeded. *Stigma* rather larger, but smooth. *Legumes* obliquely-lanceolate, sessile, thin, smooth, hard and veined on the surface, without any kind of crack or fissure, one-celled, one-seeded, about four inches long, and one and a half broad. *Seed* solitary, reniform, thin, one inch long by three-fourths of an inch broad. III. 231

14. D. *rubiginosa. Willd.* iii. 902. *Roxb. Corom. pl.* ii. *No.* 115.

Climbing. *Leaflets* from five to seven, nearly opposite, lanceolate-oblong, smooth. *Spikes* axillary, sessile.

Teling. Tella-tiga.

A large, woody, climbing species, a native of the Circar mountains. Flowering in the hot season.

Trunk large, woody, running over the highest trees. *Bark* rust-coloured, pretty smooth. *Branches* alternate, bifarious, flexuose, short, rigid, erect. *Leaves* alternate, bifarious, pinnate, with an odd one, from four to six inches long. *Leaflets* generally three pairs, alternate, sessile, oblong, the exterior ones several times larger than the inferior ones, smooth on both sides, entire, firm, with many very fine, parellel veins, the exterior one about two and a half or three inches long, and three-fourths of an inch broad. *Petioles* round, downy. *Stipules* oval, small, covered with goose-dung green down. *Spikes* axillary, compound, small. *Peduncles* downy. *Flowers* as in the former species. *Filaments* ten, conjoined in one body, which is open on the upper side.

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15. D. *volubilis. Roxb. Corom. pl.* ii. *No.* 191.

Twining. *Leaflets* five pairs, sub-alternate, oval, smooth. *Panicles* terminal. *Filaments* in two equal, five-cleft bodies. *Legumes* linear-oblong.

Teling. Bandee-gurjun.

A very large, woody, twining species, a native of the mountainous countries on the coast, where it runs up and over the highest trees.

Branches, their extremities often twine round whatever they meet with in the form of tendrils. *Leaves* alternate, bifarious, pinnate, with an odd one, four or five inches long. *Leaflets* about five pair, not opposite, nor alternate, but between the two; oval, small, pointed, entire, smooth, the exterior largest, about an inch long, by three quarters of an inch broad. *Stipules* scarcely any. *Panicles* terminal, large, bifarious; *ramifications* generally two-forked, and diverging. *Flowers* small, very numerous, blue. *Bractes* a small one below each, pedicelled, and two still smaller pressing on the calyx, oblong, nut-coloured. *Banner* orbicular, emarginate; *keel* below two-parted. *Filaments* two, placed laterally, each five-cleft, &c. as in the last. *Legume* pedicelled, linearly oblong, obtuse, membranaceous, waved, smooth, from two to three inches long, by one broad; not opening, from one to two-seeded.

16. D. *scandens. R. Corom. pl.* ii. *N.* 192.

Climbing. *Leaflets* opposite, oblong-lanceolate. *Racemes* axillary, as long as the leaves. *Legumes* linear-lanceolate, two or three-seeded.

Beng. Noa-luta.

Noël valli. *Rheed. Mal.* vi. *t.* 22. In *Willd. Sp. Pl. Vahl's Symbol.* and *Martin's Edition of Miller's Dictionary*, this figure is quoted for D. *lanceolaria*, which I think it cannot be for very obvious reasons.

Cheratalee badoo of the Telingas.

A common, very large, woody, climbing, or twining species. Flowers during the wet season.

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Branches pendulous, remarkably long, and slender. *Leaves* alternate, pinnate, with an odd one, about six inches long. *Leaflets* from three to five pairs, opposite, oblong, or broad lanceolate, obtuse, smooth, shining, entire; from two to three inches long and about one broad. *Petioles* channelled. *Racemes* axillary, single, long, bowing. *Flowers* fascicled, small, rose-coloured. *Filaments* one and nine, alternately shorter. *Legume* linear-lanceolate, membranaceous, &c. *Seeds* two, or three, kidney-form.

17. D. *tamarindifolia. R.*

Leaflets from twelve to sixteen pairs, linear-oblong. *Racemes* lateral, short, ovate, dense. *Filaments* nine in one body; *anthers* two-lobed. *Legumes* swelled, scabrous, where the single seed is lodged.

Ketee, the vernacular name in Silhet, where it is indigenous; growing to so great a size, as to run up and over trees. Flowering time March and April; seed ripe the January following.

18. D. *rimosa. R.*

Shrubby. *Leaflets* about seven, sub-alternate, oblong, finely parellel-veined. *Flowers* minute, panicled. *Filaments* ten, in one body. *Legumes* one, rarely two-seeded, rimose at the seeds.

Kaogroom, the vernacular name in Silhet, where it is indigenous in the forests; flowering in March and April, and the seed ripens in November and December.

19. D. *stipulacea. R.*

Shrubby. *Leaflets* from eight to twelve pair, alternate, linear-oblong. *Stipules* and *bractes* oblong-falcate. *Panicle* axillary, and terminal. *Filaments* ten, in two equal bodies.

An elegant bushy shrub, with small blue flowers, a native of Silhet, where it blossoms in April, and the seed ripens in November.

20. D. *spinosa. R.*

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Shrubby, erect, lateral branchlets ending in a spine. *Leaflets* from six to ten, sub-alternate, cuneate-oblong. *Racemes* axillary, few-flowered. *Filaments* in two equal bodies. *Legume* oval, one-seeded.

A native of Chittagong.

PTEROCARPUS. Schreb gen. N. 1159.

Calyx campanulate, five-toothed. *Legume** nearly round, leafy margined, varicose, one or more-celled; *cells* one-seeded.

1. P. *santalinus. Willd.* iii. 906.

Leaves ternate, with sub-rotund, retuse, smooth leaflets. *Racemes* axillary.

Sans. Chandana.

Beng. Chundana, or Rukta-chundun.

A native of Coromandel. Flowering time the hot season.

For a full description, see *Supplementum plantarum. Linn. p.* 318. *Willd.* iii. 906, &c.

2. P. *marsupium. Willd.* iii. 905. *R. Corom. pl.* ii. *No.* 116.

Leaves pinnate; *leaflets* from five to seven, alternate, elliptic, emarginate. *Panicles* terminal. *Stamens* ten in two bodies, coalesced near the base.

Teling. Yeanga-sha.

Beng. Peet-Sal.

This species, which grows to be a very large tree, seems not to have been taken notice of by any writer that I have met with. It is a native of the Circar mountains. Flowering time, the beginning of the rains, and the seed ripens about the close of the year.

* It rather deserves the name of a compressed, ligneous, varicose, one or more-celled, winged nut.

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Trunk erect, very high, though scarcely ever found straight. *Bark,* outer coat brown, spongy, falling off in flakes; inwardly red, fibrous, and astringent. *Branches* spreading, horizontal, numerous, extending far. *Leaves* sub-bifarious, alternate, pinnate with an odd one, eight or nine inches long. *Leaflets* five, six or seven, alternate, elliptic, emarginate, firm, above shining, and deep green; below less so, from three to five inches long and two or three broad. *Petioles* round, smooth, waved from leaflet to leaflet, five or six inches long. *Stipules* none. *Panicles* terminal, very large, ramifications bifarious, like the leaves. *Peduncles* and *pedicels* round, a little downy. *Bractes,* a small caducous one below each division and subdivision of the panicle. *Flowers* papilionaceous, very numerous, white, with a small tinge of yellow. *Banner* with a long slender claw, very broad; sides reflexed, waved, curled, veined. *Wings* with claws as above, oval, waved, curled, veined. *Keel* two-petalled, adhering slightly for a little way near their middle, waved, &c. as the banner. *Filaments* ten, united into one body near the base, but soon splitting into two bodies of five each. *Anthers* globose, two-lobed. *Germ* oblong, pedicelled, hairy, generally two-celled; *cells* transverse, and to the anterior margin the single ovulum of each cell is attached. *Style* ascending. *Legume,* the under three-fourths orbicular, the upper side, which extends from the pedicel to the remains of the style, straight, the whole surrounded with a waved, veined, downy, membranaceous wing, swelled, rugose, and woody in the centre, where the seed is lodged, not opening; generally one, though sometimes two-celled. *Seed* solitary, kidney-shaped.

From wounds in the bark, there issues a red juice, which hardens in the open air into a dark red, very brittle, gummy resin, on being powdered it changes to a light brown, not unlike powdered peruvian bark. In the flame of a candle it burns with difficulty, and without cracking, swelling, noise, or any peculiar smell, into fine white ashes. In the mouth it melts away like the simple gums. Its taste is strongly, but simply astringent; as much so, I think, as that of the gum of the *Butea,* which it resembles much. It tinges the spittle but little; heat does not soften it. III.

236 It is readily, and almost totally soluble in either water or spirit; the solutions are a pretty deep, but dull red, the spirituous one was rather more transparent, yet with a martial solution it shows considerably less astringency than the watery solution, here it differs from *Butea gum;* for the spirituous solution of that, although seemingly less perfect than this, shows rather more astringency with the chalybeate proof than the watery solution. The solutions bear being mixed without decomposition. Vinegar added to them makes no immediate change; mineral acids debase their colour; alkalies heighten them. In short, this substance is so exceedingly like the gum of the *Buteas,* that one analysis may serve for both. The solutions after being kept ten days showed no signs of change, and the same experiments were then repeated, with the same success.

Note. It is highly necessary to observe that the above analysis was made with the gum resin fresh from the tree, (how long it had adhered thereto I cannot say;) because I find, that when the gum of *Butea frondosa* is kept one year or two, it is less soluble in water than in spirit, and the watery solution grows sooner turbid; but at the same time this turbid solution continues as when recent, to show with a martial solution, more astringency than the spirituous.

The specimen of the *Gum-Kino* tree in the *Banksian herbarium,* is perfectly like this. It is probable these are the same, or very nearly allied.

3. P. *dalbergioides. R.*

Leaves pinnate; *leaflets* about nine, alternate, ovate-lanceolate, smooth. *Panicle* terminal. *Stamens* ten in two equal portions.

Andaman red wood.

III. 237 A native of the Andaman Islands, from thence, in 1794, young trees were sent to the Botanic garden by Colonel Alexander Kyd. These are now, 1809, from forty to eighty feet high, blossoming during the rains in June and July chiefly, and ripening their seeds eight months after.

Trunk straight. *Bark* pretty smooth for so large a tree, ash-coloured. *Branches* numerous, spreading. *Branchlets* alternate, bifarious; *young shoots* somewhat scabrous, with small gray dots. *Leaves* bifarious, alternate, pinnate, spreading, from six to twelve inches long. *Leaflets* about four or five pair, with a single terminal one, alternate, short petiolcttcd; the *inferior* ones ovate-oblong; the *superior* ones longer, and narrower in proportion, all are entire, and smooth on both sides, from two to three inches long. *Petioles* round, smooth, about six inches long. *Stipules* none. *Panicles* terminal, ramifications alternate, bifarious, expanding with their extremities, while young of a beautiful dark greenish violet-colour. *Bractes* one-flowered, ovate, villous, small, caducous. *Flowers* papilionaceous, alternate, solitary, short-pedicelled, pure yellow, delightfully fragrant. *Calyx* somewhat gibbous; mouth of five, unequal divisions, the upper two being by far the largest. *Corol; vexillum* oval; *margins* reflexed back and beautifully curled. *Wings* projecting, long-clawed, pressing on the calyx, with margins curled, as in the vexillum. *Keel* of two small petals. *Filaments* two, most distinct, as in *Dalbergia,* hence the specific name; above the middle they divide into five, alternately with somewhat shorter filaments each. *Anthers* oval. *Germ* swelled, villous, dark greenish, violet. *Style* subulate. *Stigma* acute. *Legume* two-celled, pedicelled, sub-rotund, a small part of the upper margin only being more straight, the whole surrounded with a broad, membranaceous margin; the centre where one or two seeds are lodged, is of a firm, ligneous, fibrous, tough texture, not opening spontaneously. *Seeds* reniform, a single one in each cell.

On the Andaman Islands, where the tree is indigenous, it grows to an immense size. I have seen planks of it brought from thence, which were four feet in diameter, of coloured wood;

238 and if six or eight inches be allowed for the white wood on the outside, which is not overrating it, the tree will have been above fifteen feet in circumference. The wood is not unlike Mahogany, but rather redder, heavier, and coarser in the grain. That of the root is most beautifully variegated, I may say marbled, closer grained, and darker coloured.

4. P. *indicus. Willd. ed. sp.* iii. 904.

Leaflets from six to fifteen, alternate, ovate, firm and polished on both sides. *Stipules* ensiform. *Racemes* axillary. *Filaments* ten, in two equal portions. *Fruit* nearly orbicular, from one to three-seeded.

Lingoum saxatile. *Rumph. Amb.* ii. *t.* 70.

A tree of considerable size; a native of China, the Moluccas, and eastern parts of Asia. From the former it has been brought to Calcutta, and now, April 1808, a young tree is in flower in Sir John Royds' garden. Its trunk is straight, with smooth, olive-coloured bark, and few, long, waving branches, with their extremities generally drooping much. In its scanty ramification, it differs widely from my *Pterocarpus dalbergioides* which it most resembles in other respects. In that tree the branches are more numerous with many alternate bifarious, spreading, never drooping branchlets, forming a large spreading head.

Leaves alternate, pinnate, twelve or fifteen inches long. *Leaflets* from six to fifteen, alternate, petioletted, ovate, entire, with an emarginate point, firm and polished on both sides; from three to four inches long, and from two to two and a half broad. *Petioles* flexuous, slightly channelled, smooth. *Stipules* lanceolate, caducous. *Racemes* axillary, often compound, and a much larger panicle of simple racemes terminates the branchlets. *Flowers* numerous, deep orange yellow, and very fragrant. *Bractes* of the pedicel solitary, lanceolate; of the calyx two, and smaller, all caducous at a very early period. *Calyx* short, sub-cylindric,
III. five-toothed; the upper two, larger. *Banner* with a long claw, nearly round, erect, and
239 rugose. *Wings* also curled, and exactly of the same colour. *Keel* of two small, paler coloured, less curled petals. *Filaments* ten, united into two equal, distinct bodies of five each. *Anthers* small, two-lobed, deep yellow. *Germs* oblong, pedicelled, villous, generally three or four-celled, with one ovulum in each, attached to the middle of the anterior margin of its cell; *style* rather shorter than the stamina. *Stigma* acute. *Legume* nearly orbicular, wrinkled, of a very tough, ligneous texture, never opening spontaneously, broad-winged, three or four-celled; it frequently happens that two, or even three of the cells are abortive. *Seed* solitary, of a long, narrow, oblique kidney shape, smooth, lucid, and of a brown colour.

GALEDUPA. Lamarck and Juss.

Calyx cyathiform. *Stamina* one and nine. *Legume* elliptically-falcate, plain, one or two-seeded.

1. G. *indica. Lamarck. Encycl.* ii. 594.

Arboreous. *Leaflets* three-paired, ovate, pointed. *Racemes* axillary, with many flowers in pairs. *Legumes* elliptic, one-seeded.

Dalbergia *arborea. Willd.* iii. 901.

Pongam. *Rheed. Mal.* vi. *t.* 3.

Sans. Karunjuka.

Hind. and *Beng.* Kurunja, or Kenja.

Robinia *mitis. Linn. sp.* 1044.

Pungamia, Lamarck, and Pongamia *glabra*, of Ventenat seems to be this very tree.

Robinia *mitis, Loureir. Cochin Ch.* must, I think, be a different species; and I also suspect *Caju-galedupa, Rumph. Amb.* ii. 13. to be another, which I have not yet met with.

Teling. Ganuga.

A pretty large timber tree, from forty to fifty feet high, common over all the coast,
III. Bengal, &c. *Leaves* deciduous at the end of the cold season, and in about a month are
240 succeeded by the new foliage. Flowers during the hot season; and the seed ripens toward the close of the year.

Trunk rarely straight, height very various, say from ten to twenty feet. *Bark* smooth, olive-coloured. *Branches* spreading irregularly in every direction. *Branchlets* twiggy, very long, often pendulous. *Leaves* unequally pinnate, from twelve to eighteen inches long. *Leaflets* opposite, generally three pair, oval, pointed, entire, smooth, shining, deep green; about four or five inches long, and from two to three broad. *Petioles* round, smooth. *Stipules* oval, reflexed. *Racemes* axillary, peduncled, about half the length of the leaves, erect, many-flowered. *Bractes* broad-lanceolate, two-flowered, caducous. *Flowers* pretty large, of a beautiful mixture of blue, white, and purple. *Calyx* obliquely cup-shaped, slightly four-toothed, of a dark purple colour. *Banner* very broad, emarginate; *callous* processes large as in *Dolichos*, pointed, and projecting almost directly down. *Filaments* of equal length. *Stigma* smooth. *Legume* ovate, compressed, smooth, with the *apex* thick and bent down, about two inches long, and one broad, one-celled. *Seed* generally single, compressed, almost round, smooth, light gray.

The wood of this tree is light, white, and firm; it serves for a variety of economical purposes. Branches stuck in the ground to fence round some Cinnamon trees, grew readily; grass and almost every thing else grows well under its shade. The seeds yield an useful oil, and cattle are fond of the leaves.

2. G. *piscidia. R.*

Arboreous, smooth. *Leaflets* three or five, the pairs opposite, lanceolate. *Racemes* axil-

lary and terminal, simple, or ramous. *Filaments* single and nine-cleft. Page Carey Ed.

A small tree, a native of the mountains on the border of Silhet, where it is called *Chundkee* by the natives, who powder the bark and flowers, which they throw into any small body of water, where there are fish they wish to take, by which they are said to be intoxicated, and easily caught, and are not reckoned the less wholesome by the effects of the powder. III. 241

Flowering time July; seed ripens in the cool season.

Twigs slender, and clothed with remarkably white, smooth bark. *Leaves* alternate, quinate-pinnate, and ternate, from six to eight inches long. *Leaflets* three or five, the pairs opposite, or nearly so, petiolate, lanceolate, entire, obtusely acuminate, from two to four inches long, and one or one and a half broad. *Petioles* and *petiolets* round and smooth. *Stipules.* *Racemes* axillary and terminal, frequently ramous near the base, shorter than the leaves, smooth. *Flowers* pretty large, white, long-pedicelled, and always in pairs, rather remote from each other. *Calyx* campanulate; the *upper lip* of two rounded segments; the *under* one of three, and more protruded. *Corol* papilionaceous; the *wings* and *keel* remarkably slender. *Filaments* one and nine. *Germ* pedicelled, three or four-seeded. *Style* incurved. *Stigma* single. *Legume* long-pedicelled, differing in shape according to the number of seeds, the most common form is broad-spatulate, or battle-door-shaped with a sharp beak, and then one-seeded; *surface* pretty smooth, and reticulate with veins. *Seeds* as large as common garden beans, and much like them. *Embryo* as in the order. *Cotyledons* green.

3 G. *marginata. R.*

Twining. *Leaflets* petiolate, five, seven, or nine, oblong, and cuneate-oblong, entire, smooth. *Stipules* adnate, ovate, hairy. *Racemes* lateral. *Legume* sub-orbicular, smooth; *upper margin* winged, one, rarely two-seeded.

*Oo*knee, the vernacular name in Silhet, where it is indigenous; flowering in April and May.

Stem ligneous. *Branches* and *branchlets* twining and scandent to a great extent. *Bark* brown, and marked with little gray scabrous specks. *Leaves* alternate, from six to ten inches long, unequally pinnate. *Leaflets* five, seven or nine, distinctly petiolate, the pairs opposite, and oblong, the terminal one cuneate-oblong, all are entire, and smooth on both sides; from two to four inches long. *Petiolets* and *petioles* smooth. *Stipules* ovate, peltate, hairy. *Racemes* lateral, distinct, but numerous, and approximate, generally compound, scarcely villous. *Bractes* small, ovate, obtuse. *Flowers* numerous, pretty large, with a rosy keel, white banner and wings. *Calyx* wide, bowl-shaped, obscurely five-toothed. *Stamina* one and nine. *Germ* linear, very hairy, its base embraced by a small notched cup open on the upper edge, one-celled, containing two ovula, attached to the upper margin. *Stigma* acute, and simple. *Legumes* orbicular, marginated, finely acuminate, one, rarely two-seeded. III. 242

4. G. *elliptica. Roxb.*

Twining. *Leaflets* opposite, from four to five pair, cuneate-oblong. *Racemes* panicled, axillary. *Partial peduncles* from two to five-flowered. *Calyx* bowl-shaped, almost entire. *Banner* with two scales at the base. *Legume* elliptic.

A native of Amboyna and the Malay Islands. In the Botanic garden it blossoms in March, and ripens its seed in August.

Stems scandent and twining to a great extent. *Bark* dark brown, and scabrous. *Young parts* covered with ferruginous pubescence. *Leaves* alternate, unequally pinnate, from six to eighteen inches long. *Leaflets* opposite, from four to five-paired, short-petiolate, oblong, entire, smooth, taper, obtuse-pointed, from two to six inches long, the inferior ones being the smallest. *Petioles* channelled, villous. *Stipules* broad-triangular, obtuse, permanent, ferruginous. *Racemes* panicled, axillary, one, two, or three together, composed of alternate, short, diverging, partial, villous peduncles, bearing from two to five, large, pink-coloured, villous, pedicelled flowers on their apices. *Bractes* ovate, ferruginous. *Calyx* ample, of an oblique, gibbous cup shape, with its margin slightly five-toothed. *Banner* erect, oval, emarginate, with two remarkably large, callous, margined scales on the inside, near the base. *Stamens* one and nine. *Style* ending in a tapering, incurved, smooth, pointed stigma. *Legume* compressed, elliptic, rather acute, smooth, about two inches long, and one broad. *Seed* one, rarely two, reniform. III. 243

5. G. *uliginosa. Roxb.*

Twining. *Leaflets* three or five, ovate-oblong, smooth, pointed. *Racemes* axillary, compound. *Legume* sub-orbicular, compressed, one-seeded.

Dalbergia *heterophylla. Willd.* iii. 901.

Robinia *uliginosa* of the same volume, page 1133.

Beng. Pan-luta.

A native of the lower parts of Bengal, where it is found on the wet banks of rivers, nullas, &c. Flowering time the hot season.

Stems woody, twining. *Bark* scabrous, dark brown; *young parts* smooth. *Leaves* alternate, unequally pinnate. *Leaflets* two pairs, besides the terminal one, opposite, short-petiolate, ovate, pointed, entire, smooth, and shining on both sides; the exterior one largest. *Racemes* compound, axillary, or from the old axills over the naked branchlets, erect, about as long as the leaves. *Bractes* minute. *Flowers* numerous, pretty large, of a beautiful rose-colour. *Calyx* campanulate, obscurely four or five-toothed. *Filaments* one and nine. *Legume* orbicular, with a small curved apex, compressed, smooth, rather more than an inch each way. *Seed* solitary, large, filling the whole legume.

BUTEA. Kön.

Calyx campanulate, bilabiate. *Stamina* simple, and nine-cleft. *Legume* pedicelled, mem-

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branaceous, with one seed at the apex.

1. B. *frondosa. Corom. pl.* i. *No.* 21. *Willd.* iii. *p.* 917.

Arboreous.

Sans. Pulasa.

Beng. Pulas.

Erythrina *monosperma. Lamarck. Encycl.* ii. *p.* 388.

Teling. Maduga.

Plasa. *Rheed. Mal.* vi. *t.* 16 and 17.

A middle-sized, or rather a large tree, not very common on the low land of the coast, but much more so among the mountains, and still more in Bengal. *Leaves* deciduous, during the cold season; they come out again, with the flowers, about the months of March and April; seed ripe in June and July.

Trunk generally crooked, covered with ash-coloured, spongy, thick, scabrous bark; the middle stratum of which contains a red juice, hereafter to be mentioned. *Branches* very irregularly bent in various directions. *Young shoots* downy. *Leaves* alternate, spreading, ternate, from eight to sixteen inches long. *Leaflets* emarginate, or rounded at the apex, leathery, above shining, and pretty smooth; below slightly hoary, entire, the pair are obliquely oval, from four to six inches long, and from three to four and a half broad, the exterior one obovate, and considerably larger than the lateral ones. *Common petioles* round, when young downy, as long as the leaflets. *Stipules* of the petioles small, recurved, downy, those of the leaflets subulate. *Racemes* terminal, axillary, and from tuberosities over the naked woody branchlets, rigid, covered with a soft, greenish-purple down. *Flowers* papilionaceous, pendulous, numerous, pedicelled, fascicled, very large, their ground colour a beautiful deep red, shaded with orange and silver-coloured down, which gives them a most elegant appearance. *Pedicels* round, about an inch long, articulated near the apex, and covered with the same greenish, velvet-like down. *Bractes* lanceolate, caducous, one below the insertion of each pedicel, and two smaller, pressing on the calyx. *Calyx* campanulate, leathery, two-lipped; the *upper lip* large, scarcely emarginate; the *under* one three-toothed, covered with the same dark green down that the racemes and pedicels are covered with. *Corol; banner* reflected, ovate, pointed, very little longer than the wings. *Wings* ascending, lanceolate, the length of the keel. *Keel* two-parted, ascending, large, semilunate, the length of the wings and banner. *Filaments* one and nine, ascending in a regular semi-circle, about as long as the corol. *Anthers* equal, linear, erect. *Germ* short, thick, pedicelled, lanceolate, downy. *Style* ascending, a little longer than the filaments. *Stigma* small, glandular. *Legume* pedicelled, pendulous, linear, thin, downy, about six inches long. *Seed* one, lodged near the point of the legume, oval, much compressed, smooth, brown, about an inch and a half long, and about one broad.

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From natural fissures, and wounds made in the bark of this tree, during the hot season, there issues a most beautiful red juice, which soon hardens into a ruby-coloured, brittle, astringent gum; but it soon loses its beautiful colour, if exposed to the air. To preserve the colour, it must be gathered as soon as it becomes hard, and kept closely corked up in a bottle.

This gum held in the flame of a candle swells, and burns away slowly without smell or the least flame into a coal, and then into fine light white ashes. Held in the mouth it soon dissolves; its taste is strongly, but simply astringent. Heat does not soften it, but rather renders it more brittle. Pure water dissolves it perfectly; the solution is of a deep, clear red colour. It is in a great measure soluble in spirits, but this solution is paler, and a little turbid; the watery solution also becomes turbid when spirit is added, and the spirituous more clear by the addition of water; diluted vitriolic acid renders both solutions turbid, and caustic; vegetable alkali changes the colour of the watery solution to a clean, deep, fiery blood red.* The spirituous, it also deepens, but in a less degree. Sal martis changes the watery solution into a good durable ink.

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These are, I think, proofs that a very small proportion of resin is present in this substance. In this it differs essentially from the gum-resin called *Kino* or *Gummi rubrum astringens Gambiense*, which the Edinburgh College has taken into their *Materia Medica*,† but as this can be most perfectly dissolved in watery menstruum it may prove of use, where a spirituous solution of the former, being the most complete, cannot be so properly administered; consequently it may prove a valuable acquisition also. I have used the recent gum in making my experiments, which may make some difference.

Infusions of the flowers, either fresh or dried, dyed cotton cloth, previously impregnated with a solution of alum, or alum and tartar, of a most beautiful bright yellow, which was more or less deep, according to the strength of the infusion. A little alkali added to the infusion, changes it to a deep reddish orange. It then dyed unprepared cotton cloth of the same colour, which the least acid changes to a yellow, or lemon. These beautiful colours I have not been able to render perfectly permanent.

Amongst numberless experiments, I expressed a quantity of the juice of the fresh flowers, which was diluted with alum water, and rendered perfectly clear by depuration. It was then evaporated by the heat of the sun, into a soft extract; this proves a brighter water colour than any gamboge I have met with. It is now one year since I first used it, and it re-

* With an alkalized decoction of this gum, I tried to dye cotton cloth prepared with alum, with sugar of lead, and with a solution of tin in aqua-regia; but the reds produced thereby were bad; that where alum was employed was the best.

† A specimen of the tree which produces this African substance in the *Banksian herbarium*, convinces me that it is a species of *Elæocarpus*.

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mains bright.

Infusions of the dried flowers yielded me an extract very little, if any thing, inferior to this last mentioned. They yield also a very fine durable yellow lake, and all these in a very large proportion. III. 247

The *Lac* insects are frequently found on the small branches and the petioles of the leaves of this tree. Whether the natural juice of its bark contributes to improve the colour of their red nidus, or colouring matter, I cannot say. It would require a set of experiments accurately made on specimens of *lac* gathered from the various trees it is found on, at the same time, and as nearly as possible from the same place, to determine this point.

I do not find that the natives make any use of the gum, or flowers, although they promise to be valuable. The former as a medicine; and the latter as a pigment, and dying drug.

2. B. *superba. Willd.* iii. *p.* 917. *R. Corom. pl.* 1. *No.* 22.

Shrubby, twining.

Teling. Tiga-muduga.

This is a very large, twining shrub, a native of the Circar mountains. Flowering time the beginning of the hot season, and the seed ripens in June and July.

Root spindle-form, very large. *Stem* twining, as thick or thicker than a man's leg, woody, very long, running over large trees. *Bark* ash-coloured, pretty smooth. *Branches* like the stem, but with a smoother bark. *Leaves* alternate, terminal, remote, very large. *Leaflets* downy, in other respects as in B. *frondosa*, but much larger; the exterior one is often about twenty inches long, and broad in proportion, the lateral ones somewhat less. *Racemes* as in the former, but much larger. *Flowers* also the same, only much larger, and more numerous. *Calyx* divided as the other, but the divisions longer and much more pointed. *Corol* the same. *Legumes* and *seed* as in the former, but rather larger. When this species is in full flower, I do not think the vegetable world offers a more gaudy show. The flowers are incomparably beautiful, very large, and very numerous. The colours are so exceedingly vivid that my best painter has not been able, with his utmost skill, to imitate their brightness. III. 248

From fissures, &c. in the bark the same sort of ruby coloured astringent gum exudes as was noticed in the last species. The flowers also yield the same beautiful yellow dye and pigment.

3. B. *parviflora. Roxb.*

Shrubby, twining. *Panicles* axillary, and terminal; *flowers* small, and white. *Banner* emarginate.

A native of the mountainous parts of the Rajamundree Circar, from thence Captain Alexander Denton sent the seeds to the Botanic Garden in 1797, where, when about ten years old, they began to blossom in December, and the seed ripened in April and May.

When in flower, it is immediately known by its copious panicles of small, white flowers. In other respects it is so much like *Butea superba*, that I took it for that species until it blossomed.

Stem in plants twelve years old, as thick as a man's leg, ligneous, twining. *Bark* light brown, and somewhat spongy. *Branches* numerous, twining over trees, &c. to an extent of many fathoms.

Leaves alternate, ternate, about a foot long. *Leaflets* the pair obliquely oblong, the terminal one nearly round-obovate; all are entire, obtuse, or emarginate, both sides somewhat villous, particularly underneath; of a pale dull green, about six inches long, and nearly as broad. *Petioles* round, slightly channelled, when young, villous, from three to six inches long. *Stipules* of the petioles triangular, acute. *Panicles* terminal, with the smaller or single branches thereof in the axills of the exterior leaves, branches alternate, bifarious, diverging. *Flowers* numerous, short-pedicelled, small, white, in proximate fascicles of three. *Bractes* numerous, ovate-oblong, small, downy, a common one under each fascicle, one on the base of each pedicel, and two pressing each calyx laterally. *Calyx* bilabiate, the downy upper lip bidentate; the under one three-cleft. *Corol* papilionaceous. *Stamina* one and nine. *Anthers* round. *Germ* sessile, two-seeded. *Stigma* large, smooth, pellucid. *Legume* pedicelled, linear, thin, clothed with a soft, brown, velvet-like down, apex one-seeded. *Seed* round-reniform, compressed, its greatest diameter nearly an inch. *Integument* single, smooth, brown. *Perisperm* none. *Embryo* as in the other *Leguminosæ*. III. 249

ERYTHRINA. Schreb gen. N. 1163.

Calyx bilabiate. *Corol* with the standard much larger than the small wings and keel. *Legume* pedicelled, torose.

1. E. *indica. Willd.* iii. 913.

Arborescens, armed with black prickles. *Leaves* ternate, unarmed. *Racemes* terminal, horizontal. *Keel* two-petalled, equalling the wings.

Mouricou. *Rheed. Mal.* vi. *t.* 7.

Sans. Mundar.

Beng. Palita-mandar.

Teling. Badsta-chittoo.

Dudap, or Dudap of the Malays; and when employed to support the black pepper vine, for which it is very generally used, they call it *chinkereen*.

A pretty large tree, and common over India and the Islands. Flowering time the begin-

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ning of the hot season, in March and April. Seed ripens in June and July.

Trunk pretty straight, short but thick; *branches* many, forming a large, shady head. *Bark* of the trunk and large branches smooth, of a greenish ash-colour, in the younger branches, armed with small, black, sharp prickles, which generally fall off about the third or fourth year, leaving the trunk and large branches unarmed. *Leaves* ternate. *Leaflets* smooth, and entire, the terminal one broad-cordate; the pair obliquely so, from three to six inches long, and about the same breadth. They are deciduous in the cool season, which corresponds with winter in Europe. *Petioles* round, smooth, unarmed. *Stipules* of the *petioles* falcate, those of the leaflets round, and concave underneath. *Racemes* terminal, and projecting horizontally at a right angle from the branchlet, sub-secund. *Peduncles* round, while young and tender somewhat mealy; when advanced, smooth, ferruginous purple; *pedicels* ascending in a curved direction, tern, but often so crowded as to appear verticelled. *Bractes* minute, one under each pedicel, and two on the calyx. *Flowers* numerous, large, of a bright dazzling scarlet. *Calyx* spathaceous, opening longitudinally on the upper side; apex contracted, five-toothed. *Banner* oblong, erect. *Wings* scarcely one-fourth the length of the banner, semilunar. *Keel* two-petalled, and much like the wings. *Filaments* one and nine. *Anthers* sagittate. *Germ* long-pedicelled, mealy, from ten to fifteen-seeded. *Style* so long as to elevate the erect glutinous stigma a little above the anthers. *Legume* from six to twelve inches long, cuspidate, very protuberant at the seeds, and equally so on each margin, when ripe blackish, and wrinkled. *Seeds* from six to eight, oblong, smooth, blackish-purple.

This tree is employed, in many parts of India, to support the black pepper vine. See Marsden's *History of Sumatra, page* 107. The best method for raising them is by planting cuttings of about eighteen inches, or two feet long, and about as thick as a man's arm, half under ground, if planted of a greater length, the wind is apt to shake them, which prevents their striking root. From ten or more feet asunder, according to the quality of the soil, and in quincunx order, is from my experience, the best way.

What seems to render these trees very proper for this purpose, is their quick growth, their firm, permanent, though smooth bark, which never peels off, and gives firm hold to the roots of the vine, which come out abundantly at the joints. And lastly, they are full of leaves, and very shady during the hottest months of the year, which shelters the vines from the intense heat of the sun, and keeps the ground moist. As soon as the hottest weather is over, the leaves drop and expose the vines to the sun and weather during the cool season, which I conceive renders them more healthy, and of course more productive. They must be kept in a dwarf state, by topping, and cutting off the lateral branches, for if allowed to grow without interruption, they would soon arrive at very great height, which would be very unfavourable for collecting the pepper.

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The immense quantity of large leaves that fall annually from these trees, manures the ground below them, which becomes more and more fertile, the longer it remains in this state; so that when the vines have done bearing, the land must be in a much better condition than when first planted. Daily experience proves the truth of this.

2. E. *stricta.*

Arboreous, armed with innumerable white prickles. *Leaves* unarmed. *Racemes* terminal, horizontal. *Calyx* minute, spathaceous, entire. *Wings* sub-triangular, minute. *Legumes* lanceolar, from two to three-seeded.

En-mouricou, the vernacular name at Anjenga, and Pen-mouricou that of E. *indica,* which this resembles much.

A native of Malabar; from Anjenga the seeds were received into the Botanic garden, under the Canara name *En-mouricou,* at the same time, seeds of E. *indica* were received under the name *Pen-mouricou.* Both grew rapidly, for in two years the latter flowered in April, and in three, the former began to blossom early in March, and ripened its seed by the middle of April.

Trunk perfectly straight, in our young trees eighteen inches in circumference, four feet from the ground; *branches* few, and covered with smooth olive-coloured bark, all are well armed with numerous, short, sharp, light green prickles, height about twenty feet. On the Malabar coast it grows to be a tree of very considerable magnitude. *Leaves* ternate. *Leaflets* the pair unequally broad-cordate; the terminal one reniform-cordate, all are smooth, entire, and pointed, from three to five inches each way. *Petioles* round, smooth, very rarely prickly, about six inches long. *Stipules* narrow-falcate, more permanent than the leaves. *Racemes* terminal, projecting horizontally at right angles from the apex of the new leafless branchlets. *Bractes* minute, caducous; one under each pedicel, and two near their apices. *Flowers* tern, numerous and crowded, large, as in E. *indica,* and the colour the same bright dazzling scarlet. *Calyx* minute, not above one-tenth part of the length of the banner, spathiform, entire, acute, opening on the upper side, withering. *Banner* oblong, erect. *Wings* minute, even shorter than the calyx, semi-obovate. *Keel* half the length of the banner, and four or five times longer than the wings, two-petalled, but firmly united, and in that state, when expanded ovate; *colour* pale greenish yellow, which is also the colour of the wings; with the addition of a slight tinge of pink. *Filaments* seem one and nine, but the ten are united into one, a little above the base, alternately short. *Germ* pedicelled, villous, containing from four to six ovula attached to the upper margins. *Style* tapering. *Stigma* acute. *Legume* pedicelled, lanceolar, subulate, pointed, from three to five inches long, smooth, light brown. *Seeds* one, two or three, rarely more come to maturity, lodged equally distinct from the ends, oval, smooth, light brown, of the size of a French bean.

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Note. Notwithstanding the great similarity of this tree, to E. *indica, Mouricou* of Van

Rheede, there can be no doubt of its being specifically distinct; the small, entire, spathiform, calyx and minute triangular wings, are sufficient marks by which to distinguish it from all our other Indian *Erythrinas*, exclusive of the colour of the prickles, which is, no doubt, the most obvious criterion. The contents of the germ furnish another proof; in that containing from ten to fifteen ovula, in this only from four to eight, generally about six. Page Carey Ed. III. 253

3. E. *suberosa. Roxb.*

Arboreous, with corky, deeply cracked bark. *Leaves* white, with down, ternate, prickles three-fold, and stipulary. *Petioles* armed. *Racemes* axillary, spreading. *Wings* most minute. *Keel* one-petalled.

Teling. Moonee, Maduga.

This species I have found in the Circar only; there it is much less common than the E. *indica*, but grows in every soil, and situation. *Leaves* deciduous during the cold season. Flowers in February and March, soon after the leaves appear.

In the Ganjam district, a variety is found, with the exterior leaflets reniform, and the apex perfectly rounded.

Trunk erect, generally from eight to twelve feet to the branches, covered with light gray, corky, deeply cracked bark; *branches* numerous, very crooked, spreading in every direction. *Prickles* stipulary, three-fold at the insertion of the leaves, and no where else, recurved, sharp, falling off about the third or fourth year. *Leaves* alternate, ternate. *Leaflets* the pair obliquely broad-cordate, the exterior one rhombiform, entire, above hairy; below covered with much soft, white down, three or four inches each way. *Petioles* pretty long, round, downy, armed with a few small prickles. *Glands* a pair at the insertion of the lateral leaflets, and another pair where the common petiole ends in the exterior leaflets. *Stipules* lanceolate. *Racemes* axillary, sometimes terminal, horizontal, &c. as in *indica*, but much smaller. *Flowers* as in *indica* but smaller. *Calyx* tubular, with a two-lipped mouth. *Corol; banner* as in *indica*. *Wings* minute, colourless, hid within the calyx. *Keel* one-petalled, cordate, many times longer than the wings. *Filaments* ten, all connected, alternately shorter. *Legume* pedicelled, containing generally two, though sometimes three remote seeds, the interstices filled with a gray, light spongy substance. III. 254

4. E. *ovalifolia. Roxb.*

Arboreous, armed. *Leaves* ternate; *leaflets* oval. *Petiolès* armed. *Racemes* terminal, horizontal. *Banner* obcordate.

Beng. Hari-kekra.

Is rather a scarce tree about Calcutta, which is the only place in which I have yet seen it. Flowering time the end of the cold season; the seed ripens before the rains begin.

Trunk straight. *Bark* very thick, and deeply cracked. *Branches* numerous, armed with innumerable, small, sharp, black pointed prickles. *Leaves* scattered, petioled, ternate. *Leaflets* oval, entire; *upper side* very pale green, and covered with a few, slender depressed hairs; *under side* very hoary, without any distinct kind of pubescence; from four to six inches long, and from two to three broad. *Petioles* smooth, except for now and then a few prickles; two umbilicate glands at the insertion of the pair of leaflets, and two similar ones at its apex. *Stipules* small, hard. *Racemes* simple, terminal, horizontal, from one to six. *Flowers* numerous, dark red, collected in threes round the raceme, on downy, erect pedicels. *Bractes* of the pedicels four-fold; viz. one below the insertion of each lateral pedicel, and two to the central one; small, downy; those of the calyx two, small, opposite. *Calyx* bursting open irregularly, on the outside downy, no meliferous gland could be seen. *Banner*, twice the length of the keel, erect, broad-obcordate, emarginate; *claw* long and tapering. *Wings* a third shorter than the keel, with the extremities coloured. *Stamens* ascending, one and nine, with as many corresponding glands on their inside round the base of the pedicel of the germ. *Anthers* incumbent, on alternately longer filaments. *Germ* pedicelled, downy. *Style* awled. *Stigma* small. *Legume* as in the genus.

5. E. *sublobata. Roxb.* III. 255

Arboreous, armed. *Leaves* ternate; *leaflets* sub-triangular, repand, downy underneath *Petioles* unarmed. *Racemes* terminal.

Teling. Badadum.

An immensely large tree, a native of the inland mountains in the Circars. *Leaves* deciduous. Flowering time, &c. as in the former.

Trunk erect, frequently of very great size. *Branches* spreading, very numerous, the larger as well as the trunk without prickles and covered with thick bark, the inner stratum of which is fibrous, the middle yellow, and farinaceous, the exterior a smooth, hard, yellow, firm crust, of vegetable gluten. *Prickles* strong, conical, very sharp, exceedingly numerous on the younger branches, covering them almost entirely; three of them, and generally they are the largest, stand round the marks left by the insertions of the leaves; these were the only stipules. *Leaves* alternate, ternate, from twelve to eighteen inches long. *Leaflets* the pair obliquely cordate; the odd one rhombic, all variously lobate-sinuate, or notched; above smooth, covered with soft, white down underneath, from five to six inches each way; while young covered with much rust-coloured down. *Petioles* long, round, downy, without prickles. *Glands* as in E. *suberosa*. *Stipules* three-fold, strong, conical, sharp, permanent, becoming prickles. *Racemes* terminal, erect, slender, a little downy. *Flowers* three-fold, spreading, otherwise in every respect very much like those of E. *suberosa*.

The wood of all these species is remarkably light, soft, and spongy. It is generally employed, but chiefly that of E. *indica*, being the most common, by the people who make trunks, palal, varnish, &c. to make trunks, toys, and other things that are to be varnished; its inner-

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ous, large pores admit, and retain their priming, or under coating better than almost any other wood; besides it is not liable to warp, contract, or split, and is, as before observed, exceedingly light. At the village of Kundupilla, near Masulipatam, they are particularly clever at varnishing upon these sorts of wood.

6. E. *arborescens. Roxb.*

Sub-arboreous. *Trunk* and *longer branches* prickly. *Leaves* terminal, unarmed; *leaflets* reniform-deltoid, entire. *Racemes* straight. *Bractes* three-flowered. *Calyces* truncate, entire. *Legume* pedicelled, five-pointed, villous, from six to eight-seeded.

From Nepal, Dr. Buchanan sent the seeds to the Botanic garden where in one year the plants blossomed for the first time in October. In Nepal Dr. B. observed it to be a small branchy tree ten or twelve feet high; here in seven years they are only five or six feet high, and with but very few branches.

Trunk straight, with not more than two or three, simple, ascending branches, armed with a few, scattered small, sharp prickles, otherwise smooth in every part. *Leaves* ternate. *Leaflets* entire, smooth above, whitish underneath, the exterior one nearly reniform, the pair obliquely broad-cordate. *Petioles* longer than the leaflets, round, smooth, perfectly destitute of prickles, a pair of glands at the insertion of the pair of leaflets, and another pair at the apex of the long portion which supports the terminal one. *Stipules* oval, small. *Racemes* from the terminal axills, solitary, perfectly straight, longer than the leaves. *Bractes* solitary, three-flowered, ovate, within this common bracte, there is a minute proper one at the base of each pedicel. *Flowers* numerous, large, of a vivid scarlet, three-fold, pedicelled, drooping over each other in an elegant imbricated form. *Calyx* entire, but campanulate, smooth, coloured. *Corol; banner* sub-ovate, boat-shaped, incumbent over the rest of the flower. *Wings* shorter than the keel, obliquely-obovate, greenish. *Keel* also greenish, two-parted at the base, and apex, scarcely half the length af the stamens. *Filaments* rather shorter than the banner, united into one body near the base, alternately longer. *Germ* long-pedicelled. *Style* the length of the stamens. *Stigma* acute, ascending. *Legumes* pendulous, pedicelled, villous, cuspidate, torose at the seeds. *Seeds* from five to ten.

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1. E. *resupinata. Roxb.*

Herbaceous. *Leaves* ternate, appearing after the flowers decay. *Racemes* radical, leafless; *corol* resupinate. *Filaments* one and nine.

A native of Hindoostan. In the Botanic garden they blossom in March, at which time no part of the plant is visible but the raceme.

Root perennial. *Stem* nothing more than a single, from four to five inches high, scarce prickly, slightly villous shoot, which with the leaves, decays about the close of the rains. *Leaves* ternate, rather long petioled. *Leaflets* nearly round, entire, smooth, from two to three inches each way. *Petioles* and *nerves* of the leaflets somewhat prickly. *Stipules* ovate. *Racemes* radical, short-peduncled, appearing long before the herbaceous stem, roundish-ovate, not six inches in height, but uncommonly interesting and beautiful. *Flowers* numerous, three-fold, pretty large, bright scarlet. *Calyx* bilabiate. *Corol* resupinate. *Banner* oval-shaped, much longer and larger than the keel, bright scarlet. *Wings* obovate, minute, and nearly colourless. *Keel* much longer than the wings, tinged with red. *Filaments* one and nine, alternately shorter than the banner, but double the length of the keel.

ABRUS. Schreb. gen. N. 1162.

Calyx obscurely four-lobed; the *upper lobe* broadest. *Filaments* nine, united into a sheath at bottom, gaping at the back. *Stigma* blunt. *Seeds* sub-globose.

A. *precatorius. Willd.*

Sans. Gunja, Krishnala, its red seed Ruttika.

Hind. Rutti.

Beng. Koonch or Goontch,

Konni. *Rheed. Mal.* viii. *t.* 39.

Abrus. *Rumph. Amb.* v. *t.* 32.

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Phaseolus arborescens, &c. *Pluck. Alm.* 294. *t.* 214. *f.* 5.

Gunja. *Asiat. Res.* ii. 154. and 499.

This is one of the most common plants in every part of India. Flowering time the close of the rains.

Root ramous. *Stem* ligneous, twining; *bark* smooth; *young shoots* with a few, white, depressed hairs. *Leaves* alternate, abruptly pinnate, from two to six inches long. *Leaflets* opposite, sub-sessile, from eight to fifteen pair, linear-oblong, smooth, entire, both ends obtuse, the lower pairs smaller. *Petioles*, the common channelled on the upper side, and a little hairy. *Stipules* of the leaves lanceolate, of the leaflets minute. *Racemes* axillary, solitary, long-peduncled. The peduncle itself horizontal, thick, and strong, often leaf-bearing. The raceme, or flower-bearing part, erect, secund, with the apex projecting in a curve. *Flowers* numerous, short-pedicelled, inserted on two rows of large, alternate, round, glandular tuberosities, growing on the exterior side of the raceme, pretty large, and of a pale pink colour. *Calyx* campanulate, mouth obscurely five-toothed. *Corol; banner* ovate, sides deflected, apex ascending, the length of the wings. *Wings* falcate, projecting horizontally. *Keel* cymbiform, the length of the other petals. *Filaments* nine, conjoined into a cylinder, with a fissure on the upper side, the distinct portions erect, and alternately shorter. *Anthers* ovate, small. *Pistil* minute, hid in the base of the tube of the stamens. *Germ* hairy. *Style* very short. *Stigma* headed. *Legume* of a long-rhomboidal shape, protuberant at the seeds, divided by

transverse membranes, into as many cells as there are seeds. *Seeds* generally four or five, spherical, smooth, of a bright, shining red, or white, with a black mark at the eye, or more rarely black with a white eye. Page Carey Ed.

The seeds are often used as weights by jewellers.

The root is employed as a substitute for liquorice, *(Glycyrrhiza glabra,)* being like it, sweet and mucilaginous.

Of this pretty plant, I have met with three varieties in India, viz.

1*st.* With rose-coloured flowers, red seed, and black eye. III.

2*nd.* With dark-coloured flowers, black seed, and white eye. 259

3*rd.* With white flowers, white seed, and black eye.

CROTALARIA. Schreb. gen. N. 1172.

Calyx five-parted. *Keel* beaked. *Filaments* connate, with a fissure on the back, which has a circular gape at the base. *Anthers* alternately sagittate, and sub-rotund. *Legume* turgid.

SECT. I. *Leaves simple.*

1. C. *juncea. Willd.* iii. *p.* 974. *Corom. pl.* 2. *N.* 193.

Annual, straight. *Leaves* sub-sessile, linear-lanceolate, hairy, rather obtuse. *Racemes* terminal. *Legumes* sessile, club-shaped, many-seeded.

Sans. Sana. See *Asiat. Res.* iv. *p.* 296.

Beng. Sun.

Teling. Chanamoo.

Cing. Henna, or Hane.

Katou-tandale-cotti. *Rheed. Mal.* ix. *t.* 26.

See *Philosophical Transactions of London, vol.* lxiv. *p.* 99.

An annual plant, very generally cultivated all over the southern parts of Asia for the fibres of its bark, which may be called the Hemp of India. The time of flowering and ripening its seed depend on the season it is sown; for in some parts it is raised during the rainy season, in others during the dry.

Stem annual, straight, from four to eight feet high, or even more, striated from the insertion of the leaves, a little downy, towards the top branchy, and, when the plant stands single, more so. *Leaves* scattered, short-petioled, lanceolate, obtuse, with a small bristle-like point; both sides covered with soft, silver-coloured hairs, from two to six inches long, and III. from half an inch, to one and a half broad. *Stipules* subulate, small. *Racemes* terminal, single. 260 *Bractes* oval, one-flowered. *Flowers* numerous, papilionaceous, large, of a beautiful bright yellow. *Calyx* bilabiate; the *upper lip* two-cleft; the *under* one three-parted in the middle, and there gaping; at the apex the segments are united. *Banner* obtuse, erect. *Wings* oblong, obtuse. *Keel* much pointed, slightly twisted at the apex and closely shut. *Filaments*, their lower half united into one body, with a fissure down the upper side, which has a circular gape at the base; extremities free, and alternately shorter. *Anthers* on the shorter filaments linear, on the longer ovate, and two-lobed.* *Legumes* sessile, club-shaped, downy, from one to two inches long. *Seeds* numerous, kidney-formed.

This plant yields the natives their best hemp, for they have no idea of the quality of the bark of the common hemp plant, *Cannabis*, which is indigenous in every part of India; the leaves and flowers thereof being the only parts used by them. These they employ as an intoxicating, narcotic drug, and a most powerful one it is. III.

This very useful species of *Crotalaria* is extensively cultivated by the natives in most 261 parts of India. In the Northern Circars the seed is sown towards the close of the rains, in October or November; a strong clayey soil suits it best, the farmers say; about 120 lbs. of seed to the acre, is the usual allowance. It requires no further care than being covered with the soil, which is done with the common Hindoo *harrow*, viz. a bush or two, which two bullocks, or buffaloes drag over the field. In February or March, soon after the flowers drop, and before the seed is ripe, it is pulled up by the roots, like hemp in Europe; half dried in the sun; then tied up in bundles, and committed to the water, where it is steeped, &c. The rest of the process being exactly similar to that of common hemp. Those plants that are left standing for seed, yield bark of an inferior, though stronger quality, so that the time of pulling must be attended to. Of this the natives make their cordage, twine, fishing nets, gunny, viz. a strong coarse kind of sack-cloth, &c.

This plant, and it is the only one, is also cultivated by the natives of some parts of the Northern Circars to feed their milch-cows with, during the dry season. I have found that it

* There is something very interesting in those two sorts of stamens. If a flower is opened sometime before the natural time of its expanding, which must be just before any of the anthers burst, the filaments of the subulate set will then be found considerably longer than those of the round set, and the stigma will then be about the same height; these long anthers come to maturity long before the round ones, and about the time the stigma is among them; but the style continues to grow longer, by which means the bearded stigma pushes on with it much of the pollen from the long anthers whose filaments do not now lengthen any more; but those of the round ones now begin to lengthen, pushing their anthers considerably beyond the apices of the linear set, and even with the stigma, by this economy they come in contact with it before or about the time of their maturity. These changes I have found most conspicuous in *Crotalaria juncea* and *pentaphylla*, whose flowers are very large, every part being easily seen with the naked eye.

Page Carey Ed. is very nourishing, and causes them to give more milk than most other food: it only bears two or three cuttings, after that the plants perish.

The following is an account of the cultivation of the *Sun* plant (*Crotalaria juncea* of Linnæus) and preparation of the fibres of its bark, called *Sun* by the people of Bengal.

It is a tall annual, and very generally cultivated all over the southern parts of Asia for the fibres of its bark, which may be called the *hemp* of those countries where it is cultivated. A very full and particular account of the various methods of cultivation, &c. will be found in Wissett's Book on the *Cultivation and Preparation of Hemp and Sun*, published in London in 1804; and some remarks by myself in the 22nd and 24th volumes of the *Transactions of the Society for the Encouragement of Arts, &c.* I will however give a brief statement of the usual modes in Bengal, and add such remarks as I think may be of use to improve the quality of the fibre, which is naturally excellent, probably not inferior to the hemp of Europe.

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When cultivated during the rains, which is very generally the case in Bengal, an elevated, rich, friable soil is required, which ought to be well ploughed, or otherwise dressed to free it of weeds, and bring it into good tilth. The seed, about from eighty to one hundred pounds weight to the acre, is sown when the first showers fall, about the beginning of the periodical rains in May or June, and covered in by the harrow, or any other mode. Little more is required, as the plant grows so rapidly, as to keep down the weeds itself. By August the plant will be in flower, and from five to eight, or more feet high. When the fibre is required of a fine quality, it is pulled in this stage of its growth; if strength is the object, it must stand till in seed, or even till the seed is ripe. When thought fit for the purposes intended, it is cut, or pulled up by the root.

Some recommend steeping it immediately when it is pulled, in standing fresh water, as with hemp in Europe; others, and I believe with good reason, recommend its being dried for some time previous to being steeped, upon this head much will be found in Mr. Wissett's Book.

The length of time required for steeping depends on the season of the year, the heat of the weather, and water. In August and September, from two to three days is generally sufficient. When that is accomplished, which will be known by the bark separating freely from the stalk, but not too much so as over-steeping weakens the fibre much, the people employed in the work stand in the water, in which the plant has been steeped; each takes a handful thereof which he breaks in one, or more places, after having washed off any mud, or filth; then grasps it by one end between both hands, and beats it against the surface of the water, which quickly removes the reed from the fibres; when the parcel is turned, and the other end treated in the same manner.

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This simple mode is very generally followed by the natives of Bengal, and not only removes the reed quickly, but washes the fibres at the same time; hence the *sun* of Bengal is always whiter than that of Bombay or Salsette, though they are the produce of the same plant; and it is probably the most expeditious mode that can be devised; but unfortunately the fibres are always so materially entangled, that they give but little support to each other, until by the heckle, they are in some measure restored to their natural situation, with the loss of nearly one half of the original quantity, which renders the heckled *sun* of Bengal high priced.

About Bombay, the Salsette *sun*, or *hemp*, as it is generally called, is reckoned particularly good, not inferior to the best Russian hemp, and that is all peeled by the hand. Numerous experiments made by me, induce a belief that its superiority depends on the peeling.

In that country, and in many other parts of India, the seed is sown toward the close of the rains, when a stronger soil is said to be required. In other respects the management is the same.

2. C. *tenuifolia. R.*

Perennial, ramous, straight-furrowed, hoary. *Leaves* linear, sericeous underneath. *Stipules* minute, subulate. *Racemes* terminal. *Legumes* sessile, clavate, many-seeded.

A native of Coromandel. In the Botanic garden it is perennial, growing to the height of nine feet, with numerous, slender, furrowed, straight branches, which are again more ramous at top; during the cool season each twig ends in a long raceme of large yellow flowers; and the seed ripens in two months.

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3. C. *tetragona. Roxb.*

Shrubby, erect; *young shoots* four-cornered, villous. *Leaves* linear, lanceolate, acute. *Stipules* minute, filiform. *Racemes* terminal, drooping. *Legume* sessile, clavate, hairy.

From Nepal Dr. Buchanan sent the seed to this garden in 1802, where the plants grow well, and generally blossom during the hot season; and ripen their seed two months after.

Stem erect, shrubby, with many expanding, drooping, alternate branches; *young shoots* villous, and four-cornered, whole height of the plants four or five feet, and lasting from two to four years. *Leaves* alternate, sub-sessile, linear-lanceolate, acute, slightly villous, entire, from two to six inches long, and less than an inch broad. *Stipules* filiform, minute, villous. *Racemes* terminal, solitary, drooping, few-flowered. *Flowers* remote, drooping, large, yellow. *Bractes* of the pedicel ovate, acute, solitary, one-flowered, those of the calyx, on the opposite sides of its base, and smaller than those of the pedicel. *Calyx* bilabiate; the *upper lip* bipartile, the *under* one three-cleft, but the margins of the segments are united, requiring force to separate them, otherwise it remains entire. *Legume* sessile, clavate, hairy, many-seeded.

4. C. *stipulacea. Roxb.*

Shrubby, erect, ramous, hairy. *Leaves* sessile, lanceolar, hairy. *Stipules* lanceolar, and conspicuously large. *Racemes* terminal. *Bractes* of both pedicel and calyx lanceolar. *Legumes* sub-sessile, oblong. Page Carey Ed.

A native of Mysore, from thence the seeds were sent by Mr. Heyne to the Botanic garden at Calcutta, where the plants thrive well, blossom and ripen their seed during the cold season.

Stem erect, ligneous. *Branches* erect; *young parts* very hairy; height of the whole plant three or four feet. *Leaves* simple, scattered, sessile, lanceolate, entire, very hairy; from one to two inches long, and from a quarter to half an inch broad. *Stipules* lanceolate, almost half as long as the leaves, and equally hairy. *Flowers* solitary, scattered, pretty large, yellow. III. *Bractes* lanceolate, hairy, one-flowered, three-fold under the insertion of the pedicels of the 265 lower flowers of the raceme; under those of the upper part solitary; besides these there are two at the apex of each pedicel, close to the calyx; all are permanent. *Legume* sub-sessile, smooth, thickest near the apex, more than twice the length of the permanent calyx. *Seeds* numerous, small, deep shining black.

5. C. *stricta. Roxb.*

Annual, straight, hairy. *Leaves* lanceolate. *Flowers* solitary, axillary and on terminal racemes. *Calyces* hairy, larger than the corols. *Legumes* sessile, clavate, smooth, many-seeded, shorter than the permanent calyx.

Teling. Moonga.

This species I have only found in the valleys up amongst the Circar mountains, and in my own garden, where I raised it from seeds brought from those valleys.

Root annual. *Stem* straight, from one to three feet high, striated, hairy, with few or no branches. *Leaves* scattered, very short-petioled, expanding, lanceolate, hairy underneath, entire, from three to four inches long, and less than one broad. *Stipules* minute, setaceous. *Flowers* opening in the evening, situation various, they are in general solitary, a little above the axills, and on short, terminal racemes, pretty large, of a sulphur colour. *Bractes* lanceolate, one below each peduncle, and two to the calyx. *Calyx* remarkably large, particularly the two upper divisions, very hairy. *Legume* sessile, clubbed, smooth, a little shorter than the calyx, from thirty to forty-seeded.

6. C. *montana. Roxb.*

Shrubby, erect. *Leaves* cuneate, lanceolate, obtuse, smooth. *Stipules* and *bractes* minute. *Racemes* terminal. *Legume* sessile, smooth, few-seeded.

Teling. Kunda-galli-geetsa.

This species I have never found, but upon the Circar mountains; it is a pretty large twiggy shrub. III.

Branches slender, erect, a little hairy when young. *Leaves* scattered, short-petioled, 266 linear-lanceolate, obtuse, with a bristle, entire, both sides covered with a few silver-coloured hairs, about two inches long, and little more than half an inch broad. *Stipules* most minute, subulate. *Racemes* terminal, long, many-flowered. *Bractes* very minute, subulate. *Flowers* middle-sized, yellow. *Legumes* sessile, linear-oblong, smooth, from six to ten-seeded.

Note. It differs from C. *sericea* in having very minute, awled stipules and bractes.

7. C. *linifolia. Willd.* iii. 975.

Perennial, erect, sericeous. *Leaves* sessile, narrow cuneiform, obtuse, hoary. *Stipules* none. *Racemes* terminal. *Bractes* small, one-flowered. *Legume* sessile, length of the calyx, from two to three-seeded.

A native of Hindoostan, as well as other parts of India.

8. C. *fulva. Roxb.*

Shrubby, erect. *Leaves* lanceolar, sericeous when young. *Stipules* none. *Racemes* terminal, and from the exterior axills. *Bractes* ovate, recurved, those of the pedicel solitary, those of the calyx paired. *Legume* sessile, oval, hid in the sericeous, permanent calyx, two-seeded.

A native of Mysore, from thence Dr. Buchanan sent the seed to the Botanic garden where in two years the plants blossomed in October and November, and ripened their seed in January. They were then stout, erect shrubs with a single, ligneous trunk, and many ascending branches.

Bark of the *young shoots* clothed with much soft, short, white hair. *Leaves* simple, sub-sessile, lanceolate, entire, while young sericeous on both sides, from two to four inches long. *Stipules* none. *Racemes* terminal, and from the exterior axills; the whole forming large, elegant, sub-erect, sericeous panicles, bearing numerous, large, yellow flowers. *Bractes* of the III. petioles solitary, one-flowered, ovate, recurved; those of the calyx rather narrower, and re- 267 curved; all are permanent. *Calyx* large, yellowish, and sericeous on the outside. *Legume* sessile, hid in the calyx, oval, villous, with the villous, dry, permanent style bent downwards. *Seeds* two, reniform, smooth, light brown.

The sericeous extremities, and numerous large yellow flowers, give to this stately species, a very charming appearance while in blossom.

It differs from Konig's *sericea*, (see *Retz. Obs.* v. *p.* 29.) in the want of stipules, and disposition of the bractes. C. *linifolia, (Suppl.* 322.*)* is no doubt *juncea*, a plant totally different in every respect.

9. C. *pulcherrima. Roxb.*

Shrubby, erect. *Leaves* obovate-cuneate, villous. *Stipules* none. *Racemes* terminal; *bractes* of the *peduncle* solitary, cordate, acuminate, reflected; those of the calyx lanceolate. *Legume* sessile, oblong, hid in the permanent calyx; *seeds* few.

Page Carey Ed. A native of Mysore, from thence Dr. Buchanan sent the seeds to the Botanic garden at Calcutta in 1801, and in January 1803 the plants blossomed for the first time, and ripened their seed in March. *Trunk* erect, as thick as a walking cane, covered with smooth, ash-coloured bark; *young shoots* round, and downy. *Leaves* simple, sessile, obovate-cuneate, villous; length from one to three inches. *Stipules* none. *Racemes* terminal, sometimes compound. *Bractes* of the pedicel solitary, one-flowered, sessile, cordate, acuminate, refracted, villous, and yellow. *Flowers* very large, of a lively bright yellow, and of several days duration. *Bractes* of the calyx opposite, lanceolate, expanding, villous, and not of so deep a yellow as the larger cordate bractes. *Calyx* deeply divided into five unequal segments, and clothed with fine yellow pubescence, permanent. *Legume* sessile, hid in the permanent calyx, oblong, smooth. *Seeds* a few, frequently not more than one comes to perfect maturity.

III. 268 10. C. *ramosissima. Roxb.*

Suffruticose, very ramous, hairy. *Leaves* sessile, lanceolar. *Stipules* none. *Racemes* terminal, few-flowered. *Bractes* callous-margined, and revolute. *Legume* sessile, one-seeded.

A native of the interior parts of Bengal, and in blossom most part of the year.

Root ramous, perennial. *Stem* scarcely any, but numerous sub-ligneous, small, variously bent, alternate, very hairy *branches* and *branchlets*, spread in every direction; general height of the whole plant about two feet and in diameter fully as much. *Leaves* alternate, sessile, simple, approximate, cuneate-lanceolar, entire; very hairy underneath, size of the largest, about an inch long, and scarcely one-fourth of an inch in breadth.

Stipules none. *Racemes* terminal, solitary, few-flowered. *Flowers* pretty large, yellow, tinged with deep purple. *Bractes* of the pedicel solitary; of the calyx paired; all are cordate, with callous, recurved, coloured, smoothish margins and apices. *Calyx; divisions* unequal; the upper two being much larger than the lower three; the margins of all callous, coloured, and recurved. *Legume* oval, hairy, sessile, one-seeded.

11. C. *chinensis. Willd.* iii. 974.

Perennial, diffuse, hairy. *Leaves* bifarious, from oval to linear-obtuse, hairy. *Stipules* at the forks of the branches. *Racemes* terminal. *Bractes* lanceolate. *Legumes* sessile, oval, smooth, many-seeded.

A native of pasture ground, borders of cultivated fields, &c.

Root perennial. *Stem* scarcely any, but many, diffuse, round, hairy, two-forked, slender branches, from one to two feet long. *Leaves* alternate, bifarious, short-petioled, linear-lanceolate, obtuse with a bristle, very hairy, entire, generally more than an inch long, and less than half an inch broad. *Stipules* subulate, and only at the divisions of the branches, and even there frequently wanting. *Racemes* terminal, twice as long as the pedicels. *Flowers* pretty large, yellow. *Calyx* hairy, nearly as long as the flower. *Legume* sessile, oval, smooth, shining, from fifteen to twenty-five-seeded.

III. 269 12. C. *rubiginosa. Willd.* iii. 973.

Perennial, diffuse, hairy. *Leaves* oval, and lanceolate, hairy. *Stipules* lanceolate. *Racemes* leaf-opposed. *Bractes* cordate. *Legumes* oval, hairy, few-seeded.

Like the last described, it is a native of pasture lands; it has also a perennial root, with many slender diffuse, round, hairy, two-forked branches.

Leaves alternate, short-petioled, bifarious, below round or ovate, above lanceolate, hairy, entire, very various in size. *Stipules* lanceolate, often reflexed. *Racemes* lateral or leaf-opposed, twice as long as the leaves, round, hairy, from four to eight-flowered. *Bractes* solitary, cordate, reflexed, shorter than the pedicels, one-flowered. *Legumes* sessile, oblong, hairy, eight-seeded.

13. C. *cespitosa. Roxb.*

Perennial, diffuse, cespitose, smooth. *Leaves* somewhat wedge-shaped. *Stipules* none. *Racemes* terminal. *Bractes* subulate. *Legumes* sessile, rhombic. *Seeds* from ten to twelve.

Teling. Nalla-geri-galli-geetsa.

Is one of the most common all over the coast, grows on pasture ground; is in flower all the year round.

Root perennial. *Stem* none. *Branches* numerous, spreading close to the earth in every direction, with their extremities ascending; from one to two feet long, pretty smooth. *Leaves* alternate, inclining to be bifarious, very short-petioled, linear-oblong or wedge-form, sericeous underneath; about three quarters of an inch long, and a quarter broad. *Stipules* none.

III. 270 *Racemes* terminal, very long, ascending. *Bractes* of the pedicel single, awled, one-flowered; those of the calyx two, similar, but smaller. *Flowers* small, of a bright yellow, opening in the evening. *Calyx, upper segment* emarginate. *Legume* rhombic, black, smooth, from eight to twelve-seeded. Cattle eat it.

14. C. *prostrata. Roxb.*

Perennial, diffuse, hairy. *Leaves* bifarious, oblong, hairy. *Stipules* none. *Racemes* leaf-opposed. *Legumes* sessile, clubbed, smooth, many-seeded.

Teling. Seri-galli-geetsa.

This is an uncommon species on the coast; like the former, it grows on pasture ground, has a perennial woody root, with many slender, hairy, diffuse, two-forked, round branches, from one to two feet long, their lower part often becomes woody, and perennial.

Leaves alternate, bifarious, short-petioled, obliquely-oblong, hairy, about an inch long, and half an inch broad. *Stipules* wanting. *Racemes* leaf-opposed, axillary, or terminal, three or four times longer than the leaves, from six to twelve-flowered. *Bractes* minute. *Flowers* small, yellow. *Legume* sessile, clubbed, smooth, from sixteen to twenty-four seeded.

15. C. *hirsuta. Willd.* iii. 978.

Sub-herbaceous, flaccid, hairy. *Leaves* oval, hairy. *Stipules* semi-lanceolate. *Racemes* leaf-opposed, long, from three to four-flowered. *Bractes* cordate, recurvate. *Legumes* sessile, hairy, clubbed, few-seeded. Page Carey Ed.

Teling. Nalla-galli-geetsa.

This species is scarce, it generally grows among low brushwood, on dry ground. Flowers during the wet season.

Root perennial. *Stem* scarcely any, but many two-forked, small, slender, bifarious branches, spreading on the ground, or climbing up amongst shrubs; from one to several feet long, round, hairy. *Leaves* alternate, bifarious, short-petioled, from broad-oval to oblong, hairy, from one to two inches long, and one, or one and a half broad. *Stipules* half-lanceolate, reflexed. *Racemes* lateral, or leaf-opposed, three or four times longer than the leaves, from three to six-flowered. *Bractes* cordate, reflexed, shorter than the pedicels. *Flowers* opening in the evening only, very large, yellow; the back of the banner and sometimes the wings beautifully spotted with purple. *Calyx* large; *segments* slender, hairy. *Legumes* sessile, clubbed, very hairy, from eight to ten-seeded. III. 271

16. C. *uniflora. Kön. Mss.*

Sub-herbaceous, procumbent, hairy. *Leaves* bifarious, obliquely cordate, hairy; no stipules. *Flowers* solitary, axillary. *Legumes* sessile, reniform, one or two-seeded.

Hallia *hirta. Willd.* iii. 1169.

Teling. Nalla benda.

A small, procumbent species, with perennial roots, and annual branches, a native of pasture ground. Flowers in the cold season.

Stems none. *Branches* many, spreading every way, and pressing also on the ground, about a foot long, and as thick as a packthread, two-forked, round, hairy. *Leaves* alternate, bifarious, subsessile, obliquely-cordate, of a dirty brownish green, particularly round the edges, hairy, about five-eighths of an inch long, and three-eighths broad. *Stipules* wanting. *Peduncles* axillary, short, one-flowered, about the middle articulated, with a small bracte. *Flowers* small, yellow. *Calyx* hairy. *Banner* obcordate, having the processes of *Dolichos*. *Legume* sessile, compressed, diaphanous, one or two-seeded.

17 C. *Nummularia. Willd.* iii. 979.

Sub-herbaceous, diffuse, hairy. *Leaves* cordate, hairy. *Peduncles* leaf-opposed, long, two-flowered. *Legumes* sessile, globular, hairy, many-seeded.

C. *nana. Burm. Ind. t.* 48. *f.* 2. III. 272

This is no doubt the species called by Dr. König, *biflora*, though it agrees better with Willdenow's *Nummularia* than his *biflora*, they are probably the same.

Teling. Pillee-watta-tiga.

A native of shady pasture ground, about hedges, &c. Flowers during the wet and cold seasons.

Root perennial. *Stem* scarcely any. *Branches* many, spreading amongst the grass, round, hairy, two-forked, from one to two feet long. *Leaves* alternate, sub-sessile, bifarious, obliquely cordate-ovate, or oblong, hairy, about three quarters of an inch long and half an inch broad. *Stipules* wanting. *Peduncles* leaf-opposed, longer than the leaves, round, hairy, near the apex two-forked, two-flowered. *Bractes* awled, hairy. *Legume* sessile, oval, or globular, size of a field bean, hairy, seed crowded, from twelve to twenty, kidney-form.

18. C. *retusa. Willd.* iii. 976.

Annual, and biennial. *Leaves* oblong-cuneate, slightly retuse. *Stipules* small. *Racemes* terminal. *Bractes* ensiform, recurved. *Legume* sessile, clavate, smooth, many-seeded.

Tandale cotti. *Rheed. Mal.* ix. *t.* 25.

Teling. Potu-galli-geetsa.

Beng. Beel-jhunjhun.

C. *major. Rumph. Amb.* v. *t.* 96. *f.* 1.

A common, but elegant plant, found in most parts of India. Flowering time the cool season.

Root often biennial, or more. *Stem* straight, but very short, with several, ascending branches rising from it a little above the ground, they are all slightly furrowed, otherwise round, and nearly smooth, general height of the whole plant about two feet. *Leaves* scattered, short-petioled, oblong-cuneate, with the apex oftener rounded than retuse, smooth on both sides, from one to three inches long. *Stipules* minute, acute, spreading. *Racemes* terminal, erect, many-flowered. *Flowers* drooping, large, of lively yellow, with the back of the banner tinged with red. *Bractes* solitary, ensiform, one-flowered, recurved. *Legume* turgid, sub-sessile, clavate, smooth, many-seeded. III. 273

19. C. *sericea. Willd.* iii. 975.

Annual, erect, ramous, furrowed. *Leaves* simple, sub-sessile, from obovate-cuneate, to lanceolate. *Stipules* semi-cordate. *Racemes* terminal. *Bractes* cordate. *Legume* sessile, oblong, smooth, many-seeded.

C. *sericea. Retz. Obs.* v. *p.* 26.

Sans. Ghuntaruva.

Beng. Peeyooli, Jhunjhun.

A native of Bengal. Flowering and seed time the cold season.

Root ramous, generally annual. *Stem* erect, with a few sub-erect, furrowed, slightly pal[illegible] branches; height of the whole plant from four to eight feet. *Leaves* simple, sub-sessile, obovate, the superior ones narrower, entire, with a minute bristle from the obtuse apex, from three to six inches long, and from one to three broad. *Stipules* semi-cordate, acute,

Page Carey Ed. about as long as the short vermicular petioles, permanent. *Racemes* terminal, from one to two feet long, round, smooth. *Bractes* cordate, reflexed, one-flowered, embracing the base of the pedicels; two minute sub-opposite ones near the base of the pedicels. *Flowers* very large, of a lively yellow. *Banner* with the callosities of *Dolichos* near the base. *Legume* sub-sessile, linear-oblong, smooth, inflated, many-seeded.

If the above plant is König's, or rather Retz's *sericea*, which can scarcely be doubted, the specific name is ill applied, for there is nothing sericeous about it, a few depressed hairs is all the pubescence I have been able to discover.

20. C. *verrucosa. Willd.* iii. 977.

Annual, erect, angular. *Leaves* sub-ovate, rugose. *Stipules* semi-cordate, reflexed. *Racemes* leaf-opposed. *Bractes* subulate. *Legume* sessile, many-seeded.

III. Pee-tandale-cotti. *Rheed. Mal.* ix. *t.* 29.

274 21. C. *alata. Roxb.*

Herbaceous; *branches* two-winged. *Leaves* simple, sessile, obliquely round-ovate, downy. *Racemes* terminal, becoming lateral. *Legume* short-pedicelled, linear-oblong, smooth.

Found in Hindoostan by Captain Hardwicke in flower in July and August.

22. C. *semperflorens. Willd.* iii. 978.

Shrubby, erect, ramous, smooth. *Leaves* ovate; *stipules* falcate, reflexed. *Racemes* terminal, becoming lateral. *Bractes* subulate, one-flowered. *Legume* sessile, clavate.

A native of Sumatra. Flowering in the cold season, in the Botanic garden at Calcutta. The flowers are of a middling size, and bright yellow. Is not far removed from *verrucosa*.

23. C. *bialata. R.*

Perennial, spreading; *branches* two-winged. *Leaves* sub-sessile, from lanceolar to oblong. *Peduncles* lateral, long, and smooth.

A native of Silhet. In the Botanic garden it grows to be a pretty large bushy spreading shrub, with little or no stem, but many sub-ligneous, naked, spreading branches, which divide into ascending, broad-winged, villous branchlets. Flowers and ripens its seed during the rainy and cool seasons.

24. C. *angulosa. Lamarck's Encycl.* ii. 196.

Annual. *Stem* and *branches* from three to five-sided. *Leaves* sub-sessile, base sub-ovate, much attenuated, and curled. *Stipules* semi-cordate, transverse. *Racemes* lateral.

A native of the Mauritius.

25. C. *paniculata. Willd.* iii. 980.

III. Shrubby, very ramous and hairy. *Leaves* simple, cuneate, sub-sessile. *Stipules* subulate,
275 recurved. *Panicles* terminal, large. *Bractes* numerous, subulate, recurved, clammy. *Legumes* sessile, villous, one-seeded.

From plants two years old, reared in the Botanic garden from seed received from Dr. John at Tranquebar, the accompanying drawing and this description are taken. Flowering time, in Bengal, the cold season; seed ripens in March.

Trunk short. *Branches* numerous, spreading in every direction, round, clothed with much soft hair. *Branchlets*, immediately under the panicle generally destitute of leaves, but garnished with many fasciculi of the clammy, stipulary leaflets; whole height of the plant from two to four feet, spreading to a considerably greater extent. *Leaves* simple, sub-sessile, cuneate, hairy like the young shoots. *Stipules* in axillary fasicles, subulate, recurved; margin revolute; upper surface clammy. *Panicles* terminal, large, from one to two feet long, composed of simple, expanding racemes. *Bractes* like the stipules. *Flowers* large, yellow, smelling rather offensively. *Banner*, two callosities at the base, as in *Dolichos*, downy on the back. *Germ* one or two-seeded. *Legumes* sessile, oval, downy, about as long as the long, slender acute divisions of the calyx, generally one-seeded.

SECT. II. *Leaves compound.*

26. C. *laburnifolia. Willd.* iii. 982.

Shrubby, erect. *Leaves* ternate; *leaflets* obovate, smooth. *Stipules* none. *Racemes* terminal. *Legumes* pedicelled, clubbed, many-seeded.

Nella-tandale-cotti. *Rheed. Mal.* ix. *t.* 27.

Beng. Munna.

Teling. Munna or Pedda-galli-geetsa.

C. *arborescens. Burm Zeyl. t.* 25.

An elegant, large shrubby, broom-like species; common on the southern parts of the
III. coast. Flowers most part of the year.
276 *Stem* erect, woody. *Branches* several, ascending; the whole plant from four to six feet high. *Leaves* terminal, long-petioled. *Leaflets* nearly equal, obovate, with a point, entire, smooth; about an inch long, and three quarters of an inch broad. *Stipules* wanting. *Racemes* terminal, large, many-flowered. *Pedicels* pointed, and bracted near the apex. *Bractes* of the pedicels small, one-flowered. *Flowers* large, of a bright showy yellow. *Wings* half the length of the banner, and keel. *Legume*, pedicels clubbed, smooth. *Seeds* numerous, kidney-shaped. Cattle eat it.

27. C. *orixensis. Roxb.*

Perennial, procumbent. *Leaves* ternate. *Leaflets* obovate, pretty smooth. *Racemes* lateral, long. *Bractes* cordate. *Legumes* pedicelled, cylindric, smooth, few-seeded.

Teling. Koona-galli-geetsa.

Like most of the rest, this is a native of pasture ground, borders of cultivated fields, &c.

Root perennial, white, woody. *Stems* several, procumbent; *racemes* round, hairy, from two to three feet long. *Leaves* ternate. *Leaflets* oblong, or obovate, entire, smooth on the upper side, a little hairy underneath; about an inch long and rather more than half an inch broad. *Petioles* as long as the leaflets. *Stipules* lanceolate, hairy. *Racemes* lateral, or leaf-opposed, erect, very long. *Flowers* small, remote. *Bractes* cordate, reflexed, one-flowered. *Pedicels* long, slender. *Legumes* pedicelled, pendulous, cylindric, smooth, from eight to twelve-seeded. Page Carey Ed.

28. C. *cytisoides. Roxb.*

Shrubby. *Leaves* ternate; *leaflets* alike, oblong, acute, glaucous underneath. *Stipules* minute, permanent. *Racemes* terminal. *Legume* sessile, linear-oblong, downy, few-seeded.

From Nepal Dr. Buchanan sent the seeds to this garden, where the plants blossom during the dry season chiefly. III. 277

Trunk tolerably erect, with many spreading branches, forming a large ramous shrub, of about six or seven feet in height; *young shoots* round, and clothed with fine, minute pubescence. *Leaves* ternate; *leaflets* nearly equal, oblong, or broad-lanceolar, deep green on the upper side, paler underneath; from one and a half to two inches long, and less than one in breadth. *Petioles* slender, channelled, villous. *Stipules* small, with a broad base, and subulate apex, permanent. *Racemes* at first terminal, becoming lateral as the branches extend in length. *Flowers* numerous, pretty large, pale yellow. *Bractes* of the pedicels solitary, one-flowered, small, lanceolate; those of the calyx larger and inserted obliquely on its base. *Calyx* of five equal divisions. *Legume* sessile, oblong, compressed, villous, about an inch long, and less than half that in breadth. *Seeds* few, obliquely-reniform.

29. C. *trifoliastrum. Willd.* iii. 983.

Shrubby, erect. *Leaves* ternate; *leaflets* cuneate, emarginate. *Stipules* filiform. *Racemes* terminal. *Legumes* sessile, smooth, four-seeded.

C. *Bengalensis, &c. Pluck. Alm. t.* 169. *f.* 5.

Teling. Naga-galli-geetsa.

A pretty large, erect, shrubby species; growing about hedges, borders of cultivated land, &c.

Root woody, yellow. *Stems* several, erect, woody, branchy. *Branches* twiggy, a little downy, the whole plant from one to four feet high. *Leaves* ternate. *Leaflets* broad-wedge-formed, or obcordate, emarginate with a bristle, above smooth, below with a few hairs, about an inch long, and half an inch broad. *Petioles* as long as the leaflets, channelled. *Stipules* subulate. *Racemes* terminal, or branchlet-opposed, long, straight, many-flowered. *Bractes* of the pedicel subulate, one-flowered; of the calyx two, opposite, minute. *Flowers* yellow. *Legume* sessile, almost globular, size of a pea, smooth, two-seeded. III. 278

30. C. *procumbens. Roxb.*

Perennial, procumbent. *Leaves* ternate; *leaflets* long-obovate. *Racemes* terminal and axillary, few-flowered. *Legumes* roundish, sessile, two-seeded.

A native of such places as the last, perennial.

Root yellow. *Stem* scarcely any, but several, weak, procumbent, ramous, round, smooth branches of from one to three feet long, supporting themselves on the ground, grass, or whatever is in their way. *Leaves* as in the last species, but smaller. *Stipules* as in the last. *Racemes* terminal, axillary, or lateral, generally lateral, or leaf-opposed, longer than the leaves, three-flowered. *Bractes* as in the last species. *Legume* as in the last, but smaller.

31. C. *bracteata. Roxb.*

Shrubby, erect, with many spreading branches, slightly sericeous. *Leaves* ternate; *leaflets* broad-lanceolar, acute, smooth. *Stipules* minute. *Racemes* axillary, or leaf-opposed; a pair of large ovate bractes over the calyx. *Legume* sessile, woolly, many-seeded.

A native of Chittagong. Flowering time the close of the rains, seed ripe in January and February.

Root perennial. *Trunk* short, ligneous. *Branches* numerous, dichotomous, spreading; *young shoots* round, lightly sericeous. *Leaves* alternate, petioled, ternate. *Leaflets* broad-lanceolar, acute, entire, while young slightly sericeous underneath; from three to six inches long, and from one to three broad. *Petioles* about two inches long, slightly channelled. *Stipules* minute, acute. *Racemes* solitary, erect, axillary, or opposite, shorter than the leaves. *Flowers* numerous, pretty large, yellow. *Bractes*, of the pedicel solitary, small, one-flowered; those of the calyx, paired, ovate, and projecting over the calyx like a hood, before the flowers expand; their structure and situation make the racemes appear imbricated. *Legumes* sessile, broad boat-shaped, very woolly, about three quarters of an inch long. *Seed* several, reniform, smooth, pale-coloured. III. 279

32. C. *elliptica. Roxb.*

Shrubby, spreading. *Leaves* ternate; *leaflets* elliptic. *Stipules* and *bractes* conic-ovate, acute. *Legume* sessile, oval, villous, two-seeded.

A native of China, from thence introduced into the Botanic garden where it flowers in August and September. The seed ripens in two or three months afterwards.

Stem scarcely any, but several, slender ligneous branches spreading out on each side, a little above the surface of the earth; these and the young shoots are round, and hairy, and their length from one to two feet. *Leaves* ternate. *Leaflets* elliptic, obtuse, entire, a little hairy underneath, from an inch, to an inch and a half long, and rather more than half of that in breadth. *Stipules* acute, recurvate, rigid, smooth above, hairy underneath. *Racemes* terminal, becoming lateral; about two inches long, many-flowered, hairy. *Flowers* small, yellow, solitary. *Bractes* small, ovate, acuminate, hairy, recurvate; those of the pedicels solitary,

Page Carey Ed. those of the calyx two. *Calyx* hairy, five-toothed. *Filaments* united into one body, with the fissure ending in a circular opening at the base. *Anthers* alternately linear and round as in the genus. *Legume* sessile, oval, villous, two-seeded. *Seeds* reniform, smooth.

33. C. *quinquefolia. Willd.* iii. 988.

Annual, erect. *Leaves* quinate.

Wellia-tandale-cotti. *Rheed. Mal.* ix. *t.* 28.

Teling. Neroo-galli-geetsa.

A most elegant, large, annual species, growing chiefly in the wet rice fields. Flowers during the rainy season.

Stem annual, erect, ramous, striated, piped, from three to four feet high. *Branches* stem-
III. like. *Leaves* alternate, petioled, digitate. *Leaflets* sessile, lanceolate, emarginate with a bris-
280 tle in the cleft; above smooth, below a little hairy, from one to four inches long, and from half an inch to an inch broad; the inferior ones smaller. *Petioles* as long as the largest leaflets, three-sided, with a groove on the upper side. *Stipules* reflexed. *Racemes* terminal, long, erect, many-flowered. *Bractes* single, one-flowered, lanceolate. *Flowers* large, yellow. *Stamens* and *anthers* as in the genus; the round anthers are here nearly twin, so much are their lobes divided.

ARACHIS. Schreb. gen. N. 1177.

Perianth with a long filiform tube, supporting the corol, and stamina, or its mouths. *Corol* papilionaceous. *Filaments* connected in one tube (a groove,) but no fissure on the back.

1. A. *hypogea. Willd.* iii. 1346.

Annual, diffuse. *Leaves* twice paired. *Legumes* growing under the surface of the ground.

Chamæbalanus japonica. *Rumph. Amb.* v. *t.* 156. *f.* 2.

Hind. Moong-phullee.

This very useful and common plant is to be found in all the warmer parts of Asia. Though in Bengal it appears to be rather scarce, nor have the natives any name for it, though those of other provinces have. It is also universally known in Europe, yet a full and accurate description with figures seems still to be wanting. Its parts of fructification appear to me to have been overlooked by every Botanical writer I have yet met with, on that account I have been obliged to give it a new *essential generic character* and its *natural character* at full length, from which it will be seen that this plant is in fact a *Stylosanthes.* However as its present generic name, *Arachis,* is so universally known, I think it will be better to continue it, and to place the only species of *Stylosanthes* known to me with it; for they clearly make but
III. one genus. I have at this instant both the living plants before me in high perfection, and
281 after repeated examination, can safely say that the *essential generic character* of two such widely distinct species, seldom agrees so well as in these two, (viz. *Arachis hypogea, Linn.* and *Stylosanthes mucronata. Willd.)*

Root annual. *Stems,* or rather *branches* many, diffuse, hairy, from two to four feet long. *Leaves* alternate, pinnate. *Leaflets* two pair, oval and obovate, slightly hairy underneath. *Petioles* longer than the leaflets, with the base enlarged into a stem-clasping sheath, with two ensiform processes. *Flowers* axillary, two or three together, blossoming in succession. *Bractes* a common exterior pair to the fascicle, and small proper ones to the several flowers; all are membranaceous, tapering to a fine point, and ciliate. *Calyx* with a very long, filiform, slender tube; *mouths* two-parted; the *upper lip* three-cleft, with the middle division emarginate; the *lower lip* lanceolate, and rather longer. *Corol* papilionaceous, resupinate, of a bright yellow colour. *Banner* round, emarginate, large in proportion to the other petals, inserted with the wings and carina partly on the base of the staminiferous tube, and partly on the mouths of the tube of the calyx. *Wings* free, obliquely-ovate, concave, longer than the carina, which is at the base two-parted; the upper half incurved and subulate. *Filaments* ten, united into one fleshy tube, with a groove, but no opening on the upper side. *Anthers* alternately sagittate and ovate. *Germ* ovate, lodged on the very base of the sessile tube of the calyx. *Style* long and slender. *Stigma* even with the anthers, and bearded on the inside. *Legume* oblong, leathery, swelled at each seed, reticulated with prominent nerves, one-celled, not opening spontaneously, nor are the sutures very conspicuous; length various, but in general about as thick as the little finger. *Seeds* from one to four, ovate, smooth, of the size of a French bean. The manner in which the young minute germ of the plant acquire pedicels, sufficiently long to allow them to thrust themselves into the ground to the depth of one, two, or even three
III. inches, where they grow and ripen their seed, is truly wonderful. To understand this admira-
282 ble economy, it must be observed that the flowers are most perfectly sessile, two, three, or four in the axills of the leaves, and that the germ is lodged in the very base of the tube of the calyx. Soon after the flower decays the germ acquires pedicels, after which it lengthens fast, it then enters the earth, and when the legume is perfectly formed, it will generally be found as deep in the earth as when full grown, I therefore conceive that it buries itself to its greatest depth before the seeds begin to enlarge, and while the germ is only an obtuse point.

The uses of the seed of this plant, are too universally known to render any account of them necessary in this place.

2. A. *fruticosa. Retz. Obs.* iv. *N.* 67.

Trifolium procumbens, *Burm. Zeyl. p.* 206. *t.* 106. *f.* 2. bad.

Stylosanthes *mucronata. Willd.* iii. 1166.

Teling. Saillee-kumpa.

This small, spreading, ramous, under shrub, is now common in the Botanic garden at Calcutta, first reared from seed sent by the Rev. Dr. John at Tranquebar. The plant is indigenous in Ceylon. *Leaves* alternate, ternate. *Leaflets* ovate, acuminate, slightly ciliate; scarcely half an inch long. *Petioles* at the base enlarged into a sagittate, stem-clasping sheath, which ends in two lateral acute points, one on each side. *Flowers* axillary, sessile, solitary, or in small terminal strobiliform heads. *Bractes* one-flowered. *Calyx; tube* long, slender, villous; *border* five-parted, the inferior division lengthened. *Corols* papilionaceous. The petals inserted partly on the base of thick fleshy staminiferous tubes, and partly on the mouth of the tube of the calyx. *Filaments* ten united into one tube at the base, with only the appearance of a fissure on the upper side. *Anthers* alternately linear, and ovate. *Germ* oblong, lodged in the base of the tube of the perianth. *Style* long, slender, passing through the whole tube of the calyx, elevating the acute stigma rather above the anthers. *Legume* of one or two joints, with a single seed in each. Page Carey Ed. III. 283

CARPOPOGON. R.

Calyx irregularly from four to five-parted. *Banner* cordate, incumbent on, and shorter than the unexpanding wings, and keel. *Stamina* one and nine. *Anthers* alternately round, and sagittate. *Stigma* bearded.

1. C. *pruriens. Roxb.*

Annual, twining. *Racemes* pendulous. *Legumes* armed with stinging hairs.

Dolichos *pruriens. Linn. Supp.* 657. *&c.*

Nai-corana. *Rheed. Mal.* viii. *t.* 35.

Teling. Doola gonda.

Sans. Murkuti. Atma goopta or Kupikuchoo.

Beng. Alkooshee.

Common in hedges, in most parts of India. Flowering time the cold season.

I have never been able to learn that the natives of these parts of India, make any use of any part of this plant, except the hairs of the legumes which they do not use as a medicine, (vermifuge) but as an ingredient to help to poison wells. However its having been of late taken inwardly to destroy worms, proves that it is not that poison they take it for; and it is more than likely that the other plants employed for the same base end, are fortunately much less dangerous than those who employ them imagine. Indeed it is only the most ignorant, superstitious Poligar mountaineers who are known to attempt to poison water. Nor can it be done to any other than such as is confined in wells, or small tanks.

2. C. *monospermum. Roxb.* III. 284

Perennial, twining; *umbels* axillary, pendulous. *Legume* one-seeded, and armed with very stiff ferruginous burning hairs.

Teling. Pedda, or Enooga doola-gunda, which means the larger or Elephant's *scratch wort.*

This species is perennial, and as large as any of the twining *Dolichoses* I know. It is a native of hedges, and thickets, on the banks of rivers, and water courses. Flowers during the cold season. Seeds ripen in April.

Stem woody, perennial, twining, branchy; *young shoots* covered with brown down. *Leaves* ternate. *Leaflets* ovate, acute, downy on the under side; when young they are covered with much rust-coloured down; about three inches and a half long and two broad. *Stipules* of the petioles lanceolate, hairy, falling, those of the leaflets subulate. *Umbels* axillary, short-peduncled, drooping from the weight of the flowers. *Bractes* and *flowers* as in C. *pruriens. Calyx* covered with burning hairs, unequally five-toothed, the undermost long and pointed, the rest scarcely appear above the margins of the cup. *Corol, stamens* and *pistil* as in C. *pruriens. Legume* semi-oval, deeply grooved on the back, as in *Lathyrus sativus*, very much wrinkled, pointed, about three inches long and two broad, covered with much, exceedingly stiff, brown hair, which produces a greater degree of pain and itching than that of C. *pruriens. Seed* solitary, kidney-formed, of the size of the first joint of the thumb, the convex side is entirely surrounded with the hilum.

I know of no use any part of this plant is put to. Cattle do not eat it.

3. C. *capitatum. R.*

Annual, twining. *Heads* axillary, sub-sessile. *Legumes* armed with soft, velvet-like down.

Teling. Soorootoo.

This I have only found in a cultivated state, and that during the cold season, in the gardens of the natives. It is an annual. III. 285

Stem herbaceous, twining, branchy, running to an extent of ten or twelve feet, if supported; *young shoots* slightly downy. *Leaves* ternate. *Leaflets* equal in size, the *exterior* ones ovate, about three inches long, and two broad, the lateral ones obliquely cordate, all are entire and obtuse, above smooth, a little downy underneath. *Stipules* of the petioles broad-lanceolate, of the leaflets subulate. *Peduncles* axillary, short, many-flowered. *Bractes, flowers, stamens,* and *pistil* as in C. *pruriens. Legumes* cylindric, depending, a little curved, about as thick as the fore finger, or thumb, and about six inches long, covered with soft, velvet-like down, when ripe wrinkled longitudinally. *Seeds* five or six, of the size of a small garden bean, smooth, shining, black.

The young pods like those of *Dolichos lignosus* and *lablab* are used by the natives in their curries, after rubbing off the down that covers them.

Page Carey Ed.

4. C. *niveum. Roxb.*

Annual, twining. *Racemes* pendulous. *Legumes* from six to eight-seeded, while young downy; when old destitute of down, and wrinkled.

Beng. Khamach.

Like *Carpopogon capitatum,* I have only found this in a cultivated state and even then very uncommon, having seen it but in one or two gardens near Calcutta; however, if it is not indigenous in Bengal, it must have been long known to the natives, not only on account of their having a vernacular name for it, but because it is eaten by them, as a Hindoo requires a long and intimate acquaintance with any article before he makes it a part of his diet. *Potatoes* they must have known fifty years or more, before they began to admit them at their tables.

Be that as it may, the plant is cultivated during the cold season, when it blossoms and
III. produces fruit in great abundance.
286 *Root* ramous, generally annual, though in some soils it lasts longer. *Stem* twining to an extent of some fathoms, very ramous and thick, but of a spongy, succulent nature; *young shoots* a little villous. *Leaves* ternate. *Leaflets* entire, the pair nearly semi-cordate, the terminal one rhomboidal; all have short acute points, and are nearly equal in size, of a soft delicate texture, and slightly villous on both sides; from four to ten inches long. *Petioles* round, slightly villous, from six to twelve inches long. *Stipules* lanceolate. *Racemes* axillary, solitary, pendulous, often as long, or even longer than the leaves, bearing numerous, three-fold, pendulous, very large, white flowers. *Bractes* four-fold, a common one to each tubercle of the racemes, on which the three flowers are inserted, and one to each of the proper pedicels, all are caducous, nearly lanceolate, and villous. *Calyx* four-parted. The upper division broad, and emarginate; the lower one narrowest, and more lengthened than the lateral pair. *Corol* papilionaceous. *Banner* cordate, incumbent on the wings and keel, and about half their length. *Wings* oblong, with a remarkable callous gland near the base of each. *Keel* one-petalled, linear, length of the wings, with a sharp, rigid, incurved point. *Nectary* a crenulate gland round the insertion of the germ. *Filaments* one and nine, alternately clavate and filiform, with long linear, sub-sagittate, anthers on the slender filaments, and short-ovate ones on the clavate ones. *Germ* hairy. *Style* slender and villous. *Stigma* small. *Legume* linear, about six inches long, curved a little like an Italic *S.* when ripe black, destitute of down, and longitudinally wrinkled. *Seeds* generally from six to eight, oval, smooth, ash-coloured, and separated by thin partitions.

By removing the exterior velvet-like skin of the large, fleshy, tender legumes, they are when dressed, like French beans *(Phaseolus vulgaris,)* a most excellent vegetable for our
III. tables, and the full grown beans are scarcely inferior to the large garden beans of Europe.
287 5. C. *atropurpureum. R.*

Perennial, twining. *Racemes* pendulous, often compound. *Legume* elliptic, one or two-seeded, deeply furrowed, and armed with much brown burning hair.

Tam. Tilla-kodi.

An extensive twining permanent species, a native of Travancore, from thence introduced into the Botanic garden, where it flowers in February and March, and the seed ripens in April and May.

6. C. *giganteum. R.*

Perennial, twining. *Umbels* pendulous. *Legumes* from three to six-seeded; *surface* even and armed with stiff, ferruginous burning brown hairs.

Dolichos giganteus. *Willd.* iii. 1041.

Kaku valli. *Rheed. Mal.* viii. *t.* 36.

A very extensive, twining, perennial species, with large simple pendulous, globular corymbs of large beautiful sulphur coloured flowers, which appear during the rains and cool season, and the seed ripens in March, April, and May.

PHASEOLUS. Schreb. gen. N. 1180.

Keel with the stamina and style spirally twisted.

SECT. I. *Twining.*

1. P. *vulgaris. Willd.* iii. 1030.

Twining. *Flowers* racemed in pairs. *Bractes* smaller than the calyx. *Legumes* pendulous.

Common in gardens all over India, where indigenous uncertain.

2. P. *lunatus. Willd.* iii. 1031.

III. Biennial. *Flowers* racemed in threes. *Legumes* scimitar-shaped, smooth.
288 3. P. *maximus. Sloan. Jam. t.* 111 . *f.* 1.

There are several varieties (six I know,) of this; all are cultivated for our tables. The natives rarely use any part of the plant, nor have they any vernacular name for it, hence I doubt its being a native of India. Seed sent me from North America under the name *Lima bean,* grew and produced another (a white seeded) variety of the same species.

4. P. *alatus. Willd.* iii. 1034.

Perennial, smooth. *Flowers* racemed, in pairs with a gland between. *Nectary* within the stamina, five-toothed.

Legumes pedulous.

Teling. Kar-alsanda.
Beng. Bun burbutee.
Katu paeru. *Rheed. Mal.* viii. *t.* 42.

Page Carey Ed.

The legumes in Dillenius's figure are straighter and more pointed, than in our East India plant.

A native of Bengal. Flowers in the cold season. This is by far the largest flowered *Phaseolus* I know.

5. P. *sublobatus. R.*

Annual, very hairy. *Leaflets* slightly lobed. *Peduncles* long, twining, and proliferous. *Legumes* cylindric, hairy, fourteen or fifteen-seeded.

Beng. Gora moog.

This plant I have only found in Bengal where it is indigenous. Flowering time the end of the cold and hot seasons.

Stems twining, very hairy, from three to five feet long, including the proliferous, twining peduncles. *Leaves* ternate. *Leaflets*, the lateral ones gibbous on the outside, the middle one somewhat three-lobed, all are hairy, but much less so than the stems, branches, and petioles; from two to three inches long, and about one and a half or two broad. *Petioles* the length of the leaflets, channelled, very hairy. *Stipules* adjoined, lanceolate-oblong, ciliate. *Peduncles* III. axillary, and terminal, the latter very long, proliferous, twining, and pretty smooth, when 289 compared to the rest of the plant. *Flowers* collected on oblong, terminal, glandular heads, pretty large, of a dirty greenish-yellow colour. *Legumes* cylindric, hairy, from ten to fifteen-seeded. *Seeds* dark gray, sub-cylindric, and separated by membranaceous partitions.

Children eat the seed, the plant is too much clothed with stiff long hairs, to be liked by cattle.

6. P. *calcaratus. Roxb.*

Biennial, villous. *Leaflets* somewhat three-lobed. *Stipules* lanceolar, adnate. *Racemes* elongated. *Bractes* two-flowered, with a gland between. *Carina* with a remarkable long horn. *Legumes* cylindric, pendulous, smooth, many-seeded.

Found in a cultivated state in Mysore by Mr. Benjamin Heyne, and by him the seed was sent to the Botanic garden, where the plant thrives remarkably well, and is in blossom, and ripens its seed the greatest part of the year.

Root at least biennial. *Stem* and *branches* twining, somewhat hairy, the whole plant from three to four, or more feet long. *Leaves* ternate. *Leaflets* nearly equal, the pair obliquely ovate-cordate, and generally more or less three-lobed; the terminal one sub-ovate, all are slightly villous, from four to five inches long, and from two to three broad when full grown. *Stipules* of the petiole adnate, lanceolar, those of the leaflets subulate. *Racemes* axillary, generally solitary or in pairs, sub-erect, longer than the leaves, the flower-bearing portion elongated, a rare circumstance amongst the Indian *Phaseoli*. *Bractes* of the pedicels three-fold, two-flowered, lanceolate, caducous; those of the calyx narrower, and more permanent. *Pedicels* short, with a large glandulous knob between their insertions. *Flowers* yellow, large and ornamental. *Keel* paler-coloured than either the banner or wing, and the horn on the right side (that is when looking on the back of the keel) is in this species remarkably large, thence the specific name. *Legumes* III pendulous, slender, nearly straight, cylindric, smooth; in general two or two and a half inches 290 long. *Seeds* six or seven, dark brownish black, smooth, sub-cylindric.

7. P. *dolichoides. Roxb.*

Perennial, hairy. *Leaflets* entire, broad-rhomboidal. *Stipules* ovate-lanceolate. *Racemes* axillary, longer than the petioles. *Flowers* in pairs, from numerous approximated glands. *Keel* hornless. *Legume* straight, cylindric, very hairy; *seed* from six to eight, in very distinct cells.

A native of Chittagong, where it blossoms during the rains, and ripens its seeds in the cool season.

Root ramous, perennial. *Stem* and *branches* twining to an extent of some fathoms, round, and hairy. *Leaflets* entire, hairy; the pair obliquely rhombiform, the single one much larger, and broad-rhombiform, being nearly as broad as long. *Petioles* slightly channelled, hairy. *Stipules* from oblong to ovate-lanceolate, hairy. *Racemes* axillary, solitary, erect, longer than the petioles, supporting numerous, large, short-pedicelled, dark purple flowers, inserted by pairs, on large approximated, smooth glands. *Bractes* oval, a single, caducous, common one at the base of each gland of the raceme; another more permanent one at the base of each pedicel, and lastly two pressing on the calyx laterally. *Keel* without a horn, and less twisted than usual. *Legume* straight, cylindric, as thick as a child's finger, and about three inches long, densely covered with soft light brown hairs, like plush, inwardly separated into as many very distinct perfectly round cells as there are seeds. *Seeds* six or seven, oval, of the size of a pea, speckled, with short, very dark-coloured hairs on a lighter coloured integument.

I do not find that any part of the plant is usefully employed, but its dark purple flowers render it ornamental.

8. P. *minimus. Roxb.* III.

Annual, twining. *Leaflets* ovate. *Flowers* few, capitate, long-peduncled, the horn of the 291 keel long and sharp. *Legumes* cylindric, smooth, from six to seven-seeded.

Chin. Chamloe-to.

A native of China, reared in the Botanic garden from seed received from Canton, and like most of the other leguminous plants, succeeds best during the dry season.

Root annual. *Stems* twining, filiform, of very humble growth, and almost smooth. *Leaves* ternate. *Leaflets*, the pair obliquely ovate-cordate, the terminal one two inches long. *Stipules* lanceolar, adnate, both acute. *Peduncles* axillary, solitary, about as long as the leaves,

Page Carey Ed. angular and rather harsh, each supporting a small head of a few pairs of small greenish yellow flowers, each pair inserted in a small green gland. *Stipules* lanceolate, caducous. *Calyx* campanulate, unequally five-toothed. *Banner* of an inverse reniform shape. *Keel* twisted; on the right side a long, sharp horn, which I find common to two thirds of the genus. *Legumes* cylindric, smooth, slightly incurved, scarcely two inches long. *Seeds* from four to eight, sub-cylindric, smooth, dark gray.

I do not know any of the uses of this small species, nor do I think, from its size and appearance in Bengal, that it can be applied to any useful purpose.

SECT. II. *Not twining.*

9. P. *nanus. Willd.* iii. 1036.

Annual, with weak spreading branches. *Bractes* larger than the calyx. *Legumes* pendulous, compressed, one of the smallest of the annual cultivated sorts of *Phaseoli.*

10. P. *glaber. Roxb.*

Annual; *stipules* obliquely ovate, adnate. *Leaflets* sub-cordate, entire. *Heads* long-peduncled. *Spur* of the *keel* remarkably large. *Legume* straight, cylindric, smooth, many-
III. seeded.
292 The seeds of the species were received into the Botanic garden, from the Mauritius, where I am informed the plant is cultivated under the name *Lentille De Creole.*

Stem scarcely any, but numerous, short, ramous, ascending, round, smooth branches; height of the whole plant, in our rich soil of Bengal, about two feet, and spreading fully as much. *Leaves* ternate. *Leaflets* of the pair obliquely cordate, the terminal one trapeziform, all are entire, and tolerably smooth on both sides. *Heads* solitary, short, on long, round, smooth, peduncles. *Flowers* in pairs, short-pedicelled; one on each side of a large, roundish gland, large, of a bright yellow. *Bractes* of the pedicel solitary, lanceolate; of the calyx in pairs, lanceolate. *Banner* very broad, reniform. *Horn* of the keel remarkably long and pointed. *Legume* cylindric, horizontal, straight, pointed, from three to four inches long, and about as thick as a goose-quill. *Seeds* ten or twelve, cylindric, truncated at both ends, dark brown, with lighter coloured spikes.

11. P. *Mungo. Willd.* iii. 1036.

Annual, sub-erect, ramous, the whole plant hairy. *Leaflets* cordate. *Stipules* ovate-oblong. *Legumes* horizontal, cylindrical, hairy. *Seeds* from eight to twelve, green.

P. *hirtus. Retz. Obs. f.* iii. *N.* 76.

Sans. Moodga.

Engl. Green gram.

Hind. Walli mung.

Beng. Moog.

Teling. Patcha-pessara the name of the plant; and Patcha-pessaloo of the grain.

This is one of the sorts of dry grain of the leguminous kind, which is much cultivated all over India during the cold season. I never saw it wild.

III. *Stem* annual, erect, ramous, generally about two feet high, angular, very hairy, as is every
293 part of the plant. *Leaves* terminal. *Leaflets* slightly acute, the lateral ones obliquely cordate, the terminal one rhomb-cordate. *Petioles* often as long as the leaflets, channelled. *Stipules* of the petioles adjoining, ovate-cordate, pointed at both ends, ciliate; those of the leaflets narrow-lanced, ending in a bristle. *Peduncles* axillary or terminal, when terminal they are often, in luxuriant plants compound, erect, round, shorter than the petioles, ending in an enlarged, cylindric, glandular, flower-bearing head. *Bractes* one to each pedicel, and two pressing on the calyx, they are all lanceolate, concave and falling. *Flowers* numerous, sub-sessile, pretty large, of a dirty greenish yellow. *Calyx* pretty smooth; upper segment broad, emarginate, the under one twice as large, and pointed. *Banner* broad, emarginate. *Wings*, the right one, when the flower is held from the person looking at it, and the calyx towards him, is with the keel twisted to the left. *Keel* on the left side, when the flower is held as above; there is a horn near the base, as in *Indigofera*, but here it is on one side only. *Legumes* cylindric, spreading, about two inches and a half long, very hairy, pointed. *Seeds* small, from ten to fifteen, sub-cylindric, separated by thin membranaceous partitions.

There are a great variety of plants; *culmiferous* and *leguminous*, cultivated over India, under the general name of dry, or small grain, because they require very little water, at least much less than rice, which is called the great crop. Why we also call them small grain, I cannot say, unless it is because the quantity cultivated is small, in proportion to that of rice. When the usual rains fail, which is too often the case, famine is generally the consequence; for, as rice is a water plant, it requires to be constantly flooded to make it productive. In the Northern Circars, the present year is the second, a most uncommon event, in which the periodical rains have almost entirely failed; not more than one fourth the usual quantity having fallen, viz. about fifteen inches each year instead of sixty. It is during such times that these different sorts of dry or small grains become the most serious objects of their farmer's atten-
III. tion, for on them depend the lives of thousands.
294 This plant is a considerable subject of the Indian farmer's culture. It requires a strong, rich, dry soil. During the rains it is sometimes cultivated on high lands, that do not retain water long; but the greatest quantity is raised during the cold season, on rice lands. Immediately after the rice is cut, the ground is watered, if there is no rain, from a river or some adjacent tank, then slightly ploughed, and while moist the grain is sown, and harrowed in by dragging some bushes over it. The natives have no other harrow, although I have made one and

often caused it to be used before them to harrow in Indigo seeds, yet though fully satisfied of its superior value to any thing they had any idea of, not one will follow the example. But to return to P. *Mungo*; it requires no further care; the dews which are copious at this season, furnish all the moisture it requires. In from seventy-five to ninety days, it is ready to cut. In a good soil, and with a favourable season, it yields about thirty fold. The ripe grain is well tasted, is esteemed wholesome, and affords much alimentary matter, of course it is high priced, being nearly as dear as rice, and is much used in food by the natives. Page Carey Ed.

Cattle do not like the straw; beside it is reckoned very unwholesome for them, on account of the great quantity of stiff hairs, which cover every part of the plant.

In India we have many plants of this class, that cattle will not eat; whereas in Europe they are all greedily sought after, and esteemed the richest food for them. Many of them are there extensively cultivated for that purpose; here I know of none, nor indeed any vegetable whatever, that the natives cultivate for their cattle, except the straw of the plants cultivated for the food of man, they trust entirely to bountiful Nature. In consequence of so much neglect, the poor animals suffer exceedingly during the hot season, when vegetation, except in large trees, is almost entirely at a stand, and the surface of the earth truly clad in *russel gray*. The plants of this class, like the *papilionaceæ* in Europe, improve the land on which they are raised; whereas the culmiferous, rice excepted, weaken it. The native farmers are perfectly sensible of this important fact; from them it is more than likely that the western parts of the old world first learned the art of changing their crops. III. 295

12. P. *Max. Willd.* iii. 1036.

Annual, sub-erect, every part very hairy. *Leaflets* cordate. *Stipules* lanceolar. *Legumes* ascending, hairy. *Seeds* from six to twelve, black.

Katu ulinu. *Rheed. Mal.* viii. *t.* 50.

Beng. Krishna moog.

I doubt if this be any thing more than a variety of P. *Mungo*, or *Mungo* of this. Nella-pessara is the Telinga name of the plant, and Nella-pessaloo of the grain.

Beng. Kala-moog.

Hind. Kali-mung.

Engl. Black Gram.

This, like the former, I have only found in a cultivated state. It differs from it only in being more ramous, and if possible more hairy, in having the stem and branches darker coloured, and often clouded with still darker coloured spots. The colour of the seeds is the only specific mark, if so trifling a distinction can be so called. It is constant, and so far as I have learned no change of soil, situation &c. alters it.

This is less cultivated than Moog, the grain being somewhat less esteemed, and of less value, the same soil suits it, and it is frequently mixed and sown with other sorts of grain, viz. *Holcus saccharatus*, and *Holcus sorgum*, *Linn.* These culmiferous plants rise high and shade the black pessaloo while it occupies the surface of the ground, keeping it cooler and moister than it would be without it. It is sown earlier than the green pessaloo, generally just before the close of the rains, because it likes moisture more than the other, requires about the same length of time to ripen, and yields nearly the same produce. III. 296

13. P. *radiatus. Willd.* iii. 1036.

Annual, diffuse, hairy. *Leaflets* elliptic. *Stipules* lanceolate. *Horn* of the keel very long. *Legumes* cylindric, straight, hairy. *Seeds* from four to six, black, with grey spots.

Beng. Mash-*Kuluy*; in some provinces of Hindoosthan it is called Dord.

Tekeree, is a small black-seeded variety.

Sans. Masha.

Teling. Minoomoo the name of the plant, and mimoomooloo the grain.

This like the former two I have found only in a cultivated state; it is also annual.

Stem scarcely any. *Branches* many, from one to three feet long, procumbent, winding, somewhat angular and a little twisted; it is less hairy than the former two species, and the hairs less harsh. *Leaves* alternate, ternate. *Leaflets* nearly equal, oblong, pointed, slightly scolloped, both sides hairy, three or four inches long and one and a half, or two broad. *Petioles* longer than the leaflets, channelled, hairy. *Stipules* of the petioles adjoined, oblong, pointed at both ends; those of the leaflets narrow-lanceolate, ending in a bristle. *Peduncles* axillary, erect, shorter than the petioles, hairy; the apex surrounded with many flower-bearing glandular tubercles. *Bracles* as in the former. *Flowers* from four to eight in each peduncle, middle-sized, yellow. *Calyx* pretty smooth. *Banner*, opposite to the horn of the keel is a pit, which receives the horn till the flower opens. *Keel*, the horn mentioned in the former two is here remarkably large. *Legumes* nearly erect, straight, cylindric, acute, two inches long, very hairy. *Seeds* small, from four to six, black, with gray spots.

This sort is the most esteemed of all the *Leguminæ*, and bears the highest price. Of the meal they make bread for many of their religious ceremonies. It requires a similar soil to green and black pessaloo, and is generally sown about the latter part of the rains in November, either alone or mixed with the seeds of the same culmiferous plants. Like black *pessaloo*, it thrives the better by having a few showers after it is sown. Its produce is also about thirty-fold. III. 297

Cattle eat the straw of this, and it is reckoned very nourishing for them.

13. P. *aureus. Roxb.*

Erect, diffuse, somewhat hairy. *Leaflets* semi-cordate exteriorly rhomboidal. *Horn* of the keel large, obtuse. *Legumes* cylindric, straight, pendulous, hairy, torulose, with eight or ten oval yellow seeds.

Page Carey Ed.

Beng. Sona Moog.

I have only found this plant in its cultivated state in Bengal. I believe it is unknown to the Coromandel coast. Seed-time the close of the rains, in October or November. The harvest is in February, when the plants perish.

Root nearly simple, perpendicular. *Stem* very short, but several spreading branches rest close on the ground, they are from one to two feet long, round and hairy. *Leaves* long-petioled, ternate. *Leaflets*, the pair semicordate, or nearly so, the exterior one rhomboidal, all are entire, and a little hairy on both sides, from two to three inches long, and from one and a half to two broad. *Petioles* as long as the leaflets, channelled, hairy. *Stipules* of the petiole adjoined, oblong, those of the leaflets narrow lanceolate. *Peduncles* axillary, solitary, in a rich soil often proliferous, by the time the seeds are ripe they are about as long as the petioles. *Flowers* many, short-pedicelled, of a greenish yellow, livid on the outside, brighter within. *Bractes* three-fold, one-flowered, one under the pedicel, and two pressing the calyx laterally, they are all boat-shaped, acute and hairy. *Calyx* four-cleft, the upper division broad, and emarginate. *Corol* as in the other species with the horn of the carina large, and obtuse. *Legumes* reflexed, straight, acute, cylindric, torulose, as thick as a quill, about two and a half
III. inches long, black and hairy. *Seeds* from six to twelve, small, smooth and yellow.
298 The seeds form an article of the diet of the natives; and are to be found in every bazar. The general price in Calcutta, is about two rupees and a half for a maund of eighty-four pounds weight.

14. P. *torosus. Roxb.*

Annual, rigid, erect, almost branchless, villous. *Leaflets* oval. *Racemes* axillary, one, two or more together; sub-sessile, much shorter than the petioles. *Legumes* cylindric, drooping, torose, smooth, longer than the raceme, from six to ten-seeded. *Seed* oval, white.

Seeta Maas of the Newars.

One of the cultivated legumes of Nepal; from thence Dr. Buchanan sent the seeds to the Botanic garden in 1802, where they produced a luxuriant crop during the cold season of 1802—3.

Root annual. *Stem* erect, often simple, or with an erect, downy branch or two, height of the whole plant, when reared during the cold season, from one to two feet. *Leaves* oblong, petioled, ternate. *Leaflets* ovate-cordate, entire, a little downy. *Stipules* adjoined, rather smaller than most of the other species of this genus; those of the leaflets, lanceolate. *Racemes* axillary, numerous, often several from the same axill, much shorter than the peduncle, lengthening a little as the seeds advance to maturity. *Flowers* numerous, though rarely more than one on the same raceme, expanding at the same time, of a pale sulphur colour; they expand late in the day, and soon shut and remain concealed amongst numerous scariose bractes. *Calyx, divisions* five and nearly equal. *Horn* of the carina small. *Legumes* reflexed, cylindric, torose, smooth, from six to ten-seeded, and longer than the whole of the raceme. *Seeds* short, sub-cylindric, smooth, of a pale cream colour.

III. 15. P. *trilobus. Willd.* iii. 1035.
299 Herbaceous, procumbent. *Leaflets* three-lobed. *Lobes* oval. *Stipules* ovate-lanceolate. *Peduncles* longer than the leaves, few-flowered. *Legumes* cylindric, smooth, six-seeded.

Dolichos *trilobus. Burm. Ind. t.* 50. *f.* 1.

Glycine *triloba. Willd.* iii. 1056.

Trifolium madraspatense. *Pluck. Alm. t.* 120. *f.* 7. good.

Hind. Rakhal-kulay.

Teling. Pelli pessara.

This species I have never found but in its wild state. It grows on the banks of water courses, borders of rice fields, and in moist cultivated spots. Flowering time most part of the year.

Root sometimes perennial. *Stems* annual, many, diffuse, sometimes rooting at the joints, never twining, round, sometimes hairy, sometimes smooth, from one to four feet long. *Leaves* ternate. *Leaflets* equal, varying much in form, but generally three-lobed, sometimes smooth, sometimes hairy, according to the soil, about an inch each way. *Petioles* longer than the leaflets, erect, channelled. *Stipules* of the petioles ovate, adjoined; of the leaflets small, oval. *Peduncles* axillary, very long, often two feet, ascending, hairy, headed as in the other species. *Flowers* small, yellow, from four to eight composing the head. *Legumes* as in the last, but smooth. *Seeds* gray.

The seeds are gathered and eaten by the poor, being reckoned equally wholesome as the cultivated sorts and are as palatable, but the plant produces so little, that it is not worth the farmer's while to cultivate it. It is no doubt what Dr. König considered *P. aconitifolius.* Cattle eat it greedily.

16. P. *aconitifolius. Willd.* iii. 1034.

Annual, diffuse. *Leaflets* from three to five-lobed; *lobes* linear lanceolate. *Head* long, peduncled, many-flowered. *Legumes* horizontal, cylindric, smooth.

III. *Hind.* Moot.
300 This plant I have reared from seed sent me by Dr. Hunter from the province of Oude where it is much cultivated, as it also is over the adjoining provinces to the westward, and used for feeding cattle; seed-time there, June and July; harvest in November.

Root annual, perpendicular, with few fibres. *Stems* numerous, spreading close in the ground, and extending from two to twelve feet every way; succulent, angular and a little hairy. *Leaves* ternate. *Leaflets* deeply divided into three, or five, linear-lanceolate, somewhat hairy, entire lobes. *Petioles* longer than the leaflets, deeply channelled above, with ridges un-

derneath. *Stipules* of the petioles adjoined, ovate-lanceolate; those of the leaflets subulate. *Peduncles* axillary, solitary, nearly as long as the petiole, but much more slender, angular and somewhat hairy, each ending in an oblong glandular head, of many small, yellow, short-pedicelled flowers. *Bractes* lanceolate, ciliate. *Calyx; corol,* &c. as the genus. *Legume* horizontal, cylindric, pretty smooth. Page Carey Ed.

The uncommon luxuriance of this plant gives reason to think it will yield a much larger crop of fodder than any other I am acquainted with.

DOLICHOS. Schreb. gen. N. 1181.

Two callosities at the base of the banner, parallel, oblong, compressing the wings underneath.

1. D. *gladiatus. Willd.* iii. 1039.

Perennial, twining, smooth. *Leaflets* ovate-cordate, rather acute. *Legumes* gladiate, three-keeled, or two-grooved on the back, the middle one three-ribbed. *Seeds* arilled, red, white, or gray.

Beng. Mukhun-shim.

D. *ensiformis. Syst. Veg.* 547. *Kæmp. tab.* 39.

Bara mareca. *Rheed. Mal.* viii. *t.* 44.

Lobus machæroides. *Rumph. Amb.* v. *t.* 135. *f.* 1.

Phaseolus *maximus. Sloan. Jam. p.* 177. *t.* 114. *f.* 1. 2. 3. good. III. 301

There are two varieties of this cultivated in Bengal, one with white, the other with red flowers; both have red beans. The young, tender, half-grown pods of both are good substitutes for those of the common *Phaseolus,* commonly called French beans. From Pegu a third variety has been received into the Botanic garden, which differs from the former two in the following respects, viz.

In the legume being rather straighter, and the seeds light gray, instead of red, but the flowers are red. The same variety has also been found in the Silhet district, together with a fourth which is every way larger; the flowers white, the legumes truly gladiate, about two feet long, and often containing as many as twenty large, white, arilled seeds. This variety is reckoned the most wholesome of them all, and is very extensively used at the tables of Europeans, as well as by the natives in that district.

2. D. *Virosus. Roxb.*

Biennial, twining, smooth. *Leaflets* oval. *Stipules* short, subulate. *Racemes* sub-secund. *Legumes* three-keeled on the back; seeds from four to eight, arilled.

Katu-Barameraca. *Rheed. Mal.* viii. *t.* 45.

D. *ensiformis. Lour. Cochin Ch.* 531. His long-legumed variety is most likely one of the varieties of D. *gladiatus.*

Beng. Kath-shim, or Kala-shim.

Teling. Aduvi-shamba.

A native of hedges, &c. in most parts of India, and in flower and fruit a great part of the year.

Stems may be reckoned biennial, twining to the extent of several fathoms, round, and smooth in every part. *Leaves* ternate. *Leaflets* nearly equal, oval, scarcely pointed, entire and smooth, from two to three inches long. *Petioles* about as long as the leaflets, channelled. *Stipules* short, like short inoffensive thorns; those of the leaflets subulate. *Racemes* axillary, solitary, as long, or longer than the leaves, sub-secund. *Flowers* in pairs, on round glands, scattered over the exterior half of the rachis, large, of a beautiful rosy purple. *Calyx* bilabiate; *upper lip* of two broad, circular lobes; the under one three-toothed and small. *Banner* erect, roundish, emarginate. *Wings* and *keel* falcate. *Style* and *stigma* smooth. *Legumes* linear, scimitar-shaped, smooth, from four to six inches long. Hard, tough, with the upper margin three-keeled, or two-groved, as in D, *gladiatus* and *rotundifolius. Seeds* from four to eight, oblong, considerably larger than a field bean, smooth, light gray; each enveloped in a white, tough, membranaceous aril. III. 302

I do not find that any part of this species is in any shape useful to the natives, or others; indeed the natives of Coromandel, where the plant is common, reckon it poisonous, which is corroborated by Van Rheed.

3. D. *rotundifolius. Vahl. Symb.* ii. *p.* 81. *Willd.* iii. 1040.

Biennial, twining, smooth; *leaflets* obovate, rotund. *Legumes* semi-elliptic, from three to four inches long. *Back* three-keeled. *Seeds* from three to five, obovate, gray, in a common membranaceous aril.

Katu-Tsjandi. *Rheed. Mal.* viii. *t.* 43, which is also quoted by Lamarck for his D. *obtusifolius. Encycl.* ii. 295.

A native of the Islands about the mouth of the river Godaveri, &c. on the coast of Coromandel. Flowering time the rainy season.

4. D. *sinensis. Willd.* iii. 1038.

Annual, twining, smooth. *Peduncles* longer than the leaves, many-flowered. *Legumes* long, pendulous, cylindric, torose.

Hind. Lobia.

Teling. Alsanda.

New. Haco-bhati.

D. *sinensis. Rumph. Amb.* v. *t.* 134. III. 303

D. *sesquipedalis. Willd.* iii. 1040.

Page Carey Ed.

Of this we have two varieties, one with white, and the other with brown seed. The first is most esteemed for the table. Seeds of the second were sent to me by Dr. Klien, and Dr. Rottler of Tranquebar, two good Botanists, under the name of *Dolichos Tranquebariensis. Willd.* iii. 1039.

5. D. *obcordatus. R.*

Perennial, twining, smooth. *Leaflets* obcordate, emarginate. *Racemes* erect. *Legumes* linear-oblong, straight, three-keeled, or two-grooved in the upper margin, dagger-pointed, from five to six-seeded. *Seeds* dark brown.

From Canton in China the seeds of this very beautiful odoriferous species, for so its red violet flowers are during the forenoon, were received into the Botanic garden at Calcutta, where the plant blossoms during the rains and the seed ripens in the cold season. It is most evidently allied to *gladiatus*, *virosus*, and *rotundifolius*, but differs most conspicuously from all in the shape of the leaves.

6. D. *Caljang. Willd.* iii. 1051.

Annual, twining. *Leaflets* sub-deltoid, angular behind. *Peduncles* few-flowered. *Legumes* sub-cylindric, erect.

Paeru. *Rheed. Mal.* viii. *t.* 41. is broader-leaved than any I have met with.

Teling. Bobra, the name of the plant. Boberloo the seed or pulse.

Beng. Burbuti.

Phaseolus erectus, &c. Sloan. Jam. t. 117. is very like our plant.

Kurson pyro, the Canara name of the black-seeded variety.

Three or more varieties of this useful species are found cultivated in the fields in many parts of India, during the dry season, viz. from October until February.

III. 304

Stem always twining, except in a very poor soil, round, but rather harsh to the feel; extent various according to the soil, and season. *Leaves* ternate. *Leaflets* between deltoid, parabolic, and hastate, angular behind, rather obtuse; smooth on both sides, from two to three inches long. *Petioles* nearly as long as the leaflets, deeply channelled. *Stipules* of the petioles adnate, ovate, acute at both ends; those of the leaflets roundish. *Peduncles* axillary, solitary, from two to eight or twelve inches long, bearing a few, large, bluish flowers on a short, glandular head. *Calyx* campanulate. *Segments* subulate. *Banner* large, nearly round, of a pale blue on the inside, and greenish yellow on the back. *Callosities* keeled, and yellowish. *Wings* blue, semilunar. *Keel* nearly white. *Filaments* beyond their tube long, fine and inclined to twist. *Anthers* minute. *Style*, the exterior half much bearded on the inside. *Legumes* nearly straight, erect, cylindric, smooth, as thick as a large quill; *apex* more or less recurved and concave behind. *Seeds* from six to twelve, sub-cylindric, ends truncated, smooth, colour and size varying in the different varieties.

With Dr. König, I was long inclined to consider this a variety of D. *Sinensis* and as such transmitted to the Honourable the Court of Directors a short description of the plant, without any drawing; but more experience induces me to consider them distinct on account of the shape of the leaves, independent of the great difference in their size. This is the description of the variety most generally cultivated on the Coromandel coast.

A rich friable soil suits these plants best. On the Peninsula the seed is sown in October, immediately after the rains, and the crop gathered in February; it produces in a good soil, about forty fold. The grains, or pulse is low priced, generally eaten by the poorer classes, and the straw is given to the cattle.

The variety with smaller black seeds which is more slender, and the leaves narrower, is considered by Dr. Klien of Tranquebar a distinct species, the seed of which he sent me under the name *Dolichos capitatus.*

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7. D. *tetragonolobus. Willd.* iii. 1040.

Annual, twining, smooth. *Legumes* pendulous, with four membranaceous lacerated angles.

Lobus quadrangularis. *Rumph. Amb.* v. *t.* 133.

Reared in gardens for the table. Where indigenous I cannot say; like by far the greater part of the genus they thrive best during the cool time of the year, viz. from October to March. We have an herbaceous variety from Pegu, with tuberous esculent roots.

8. D. *lablab. Willd.* iii. 1037.

Perennial, or annual, twining, generally smooth. *Racemes* erect with alternate fascicles of short pedicelled flowers on glandular knobs. *Legumes* horizontal, compressed, semilunar, with a straight scabrous back, ending in a straight daggered point. *Seeds* from three to five, with a larger edge on the exterior margin.

Of this species there are known to me five varieties in a cultivated state, and two wild. A short description of what I reckon the first variety, viz. Annapa of the Telingas, will serve for the other six.

1*st. Teling.* Annapa.

Stem for about a foot erect, thin, with its branches twining, and running to a considerable extent if supported; round, smooth. *Leaves*, *stipules*, and *racemes* as in D. *lignosus*. *Legumes* horizontal, semilunar, compressed, with the margins rugose, and the apex straight, subulate. *Seeds* from three to four.

The whole of this plant has a heavy disagreeable smell, something like the green bug, *(Cimex viridulus.)* It is much cultivated in the fields during the cold season, and delights in a rich, black soil, which cannot be flooded by rains. Like *Bobra*, it requires three months from the sowing, till ripe; yields in a good soil, about forty fold. These seeds bear a low price,

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compared to most other sorts of grain. They are much eaten by the poorer classes, particularly when rice is dear. They are not palatable, but reckoned wholesome substantial food.

Cattle are also fed with the seeds, and they are remarkably fond of the straw. It is said to make cows yield much milk. The other six varieties are:— Page Carey Ed.

2*d*. *Teling*. Annapa chikurkai.

Cacara alba. *Rumph. Amb.* v. *t.* 137.

Dolichos *albus*. *Lour. Cochin Ch.* 534.

D. *Bengalensis*. *Linn. Syst* 657.

Cultivated in gardens and supported by poles or pendals, often forming arbours about the doors of the poor natives. Differs from the first variety, (*Annapa*) in being a little downy, with the legumes a little inclined to a curved, wedge shape, and is void of the disagreeable smell of *Annapa*. The tender legumes of this, and the three following varieties are much used by the natives in curries; the ripe seed is never eaten.

3*d*. *Beng*. Geea-shim.

Cacara, sive Phaseolus perennus. *Rumph. Amb. t.* 136.

This is larger than any of the former, is tinged with red. *Peduncles* short, with red flowers. Is also cultivated like the last, and much esteemed by the Hindoos.

4*th*. *Beng*. Goordal-shim.

Is a still larger variety with purple flowers in nearly sessile heads. *Legumes* broader, with the seeds more remote than in any of the other varieties. Is also cultivated here in the same manner as the two last.

5*th*. Dolichos *purpureus*. *Lour. Cochin Ch.* 534. *Willd.* iii. *p.* 1084.

D. *lablab*. *Bot. Mag.* 896.

I cannot consider this as any thing more than a variety of *lablab*, differing in colour only; the whole plant being deeply tinged with red, the flower is deep red, and the legumes of a bright reddish purple. It is rare in Bengal. The seeds of all the cultivated varieties are sown about the close of the rains, and produce their crop during the cold season. III. 307

6*th*. *Beng*. Bun-shim.

Teling. Adavi chikurkai.

Dolichos spicatus. *Kön. Mss.*

Cacara litorea. *Rumph. Amb.* v. *t.* 141. *f.* 1.

Smooth in every part, and frequently biennial if not perennial. It is never cultivated, nor any part of it used.

7*th*. For the seventh variety I have no Asiatic name. It is found with the former wild in the hedges, &c. near Samulkota, and differs from it in being very downy; both have red flowers and dark gray, mottled seeds. No part of these two varieties is made any use of.

9. D. *lignosus*. *Willd.* iii. 1049.

Perennial, twining, smooth. *Racemes* erect, long with alternate fascicles of short pedicelled flowers, on glandular knobs. *Legumes* linear, oblong, slightly incurved, torulose, both margins turned and rugose, with a subulate, recurved apex. *Seeds* about four.

I include under the above definition many varieties, some of them hitherto deemed distinct species. All are cultivated during the cold season in the gardens and about the doors of the natives; forming not only cool, shady arbours, but furnishing them with an excellent pulse for their curries, &c. in the tender legumes. In short these, and the four last mentioned, cultivated varieties of *lablab*, may be called the *Kidney beans of the Asiatics*.

Var. 1*st*. *Beng*. Panch-shim.

Teling. Tella chikurkai.

The flowers are white, the legume straighter than in some of the other varieties, and the seed reddish. I take it to be *Loureiro's* D. *unguiculatus*, but not that of Rumphius. The following full description of this variety will serve for the other five.

Stem biennial or triennial, although seldom allowed to remain more than one year, twining, the lower parts becoming woody, and as thick as the thumb, round, smooth, running to an extent of many feet, or even fathoms, when supported. *Leaves* ternate. *Leaflets* broad cordate, smooth, entire, nearly equal, from three or four inches long, and nearly the same breadth. *Stipules* of the petioles cordate, pointed, reflexed, those of the leaflets semi-lanceolate. *Racemes* axillary, rigidly erect, longer than the leaves, sometimes leaf-bearing. *Flowers* large, pure white, collected on remote, glandular globular tuberosities. *Bractes* one to the insertion of each pedicel, and two pressing the calyx laterally. *Banner*, its callosities are remarkably large. *Nectarial cup* as in D. *gladiatus*. *Legumes* horizontal, somewhat scimitar-shaped, protuberant, somewhat inflated, while green both margins very rugose, with a subulate apex, recurved, about as thick and long as the little finger. *Seeds* about four, oval; *hilum* large, bending round the upper extremity. III. 308

Var. 2*d*. Bagha-nakhooa (Tiger's claw) shim. *Peduncles* short. *Flowers* white. *Legumes* falcate, size of the little finger.

Var. 3*d*. Sada-Jamai-kooli-shim. *Peduncles* short. *Flowers* white. *Legume* of a pretty straight gladiate-clavate shape, and about the length of the little finger.

D. *cultratus*. *Willd.* iii. *p.* 1039. and *B. H. Banks' Icon. t.* 25.

Var. 4*th*. Pituli-jamai-pooli-shim of the Bengalees. *Peduncles* short. *Flowers* reddish purple, differing in this respect only from last, for the legumes are the same.

Var. 5*th*. Doodha-pituli-shim. *Large peduncles* pretty long. *Flowers* purple. *Legumes* falcate, and much longer than in Bagha-nakhooa.

Var. 6*th*. Ganchi-shim of the Bengalees.

Nulla chikurkai of the Telinga. The largest of all. *Peduncles* long. *Flowers* red. *Legumes* from six to eight inches long, much curved. *Seeds* black, with a white eye. III. 309

10. D. *bulbosus*. *Willd.* iii. 1046.

Page Carey Ed.

Root tuberous. *Stem* twining. *Leaflets* villous, with their exterior margins sinuate dentate.

Cacara bulbosa. *Rumph Amb.* v. *t.* 132 *f.* 2. bad.

On the continent of India this plant is an exotic, and has been introduced from the Malay Islands. Probably first from South America to the Philippine Islands, a route by which several plants have found their way from the new world, to the eastern parts of Asia, and from thence the useful kinds soon find their way to the westward. See Rumphius's account of the plant, at page 373 of the 5th volume of his *Herbarium Amboinense.*

Root tuberous, not in bundles but single, varying much in shape, and with high culture, growing to a very great size; *outside* white, *inside* much like that of a turnip. *Stem* ramous, sometimes perennial, twining to a great extent. *Young parts* tolerably well clothed with reflexed soft hairs. *Leaves* ternate. *Leaflets*, the pair nearly triangular, the interior one of a rhomb-reniform shape; in all, the interior margins are serrate-dentate, and somewhat villous on both sides; *size* various, the largest often six inches each way. *Petioles* channelled. *Stipules* of the petioles ensiform,* those of the leaflets filiform. *Racemes* axillary, from one to two feet long, sub-erect, bearing numerous fascicles, of large, short, pedicelled, beautiful, violet blue flowers inserted on large glandular knobs. *Bractes* of both pedicel and calyx small, and caducous. *Calyx* four-parted, the upper lip, or division, broad, emarginate. *Vexillum* sub-rotund; *wings* semilunate, with a long filiform projection at the base. *Filaments* alternately shorter. *Germ* with a crenulate nectarial ring round the base; *apex* of the style spirally incurved, almost as in the
III. *Phaseoli.* *Stigma* large. *Legume* linear, straight, compressed, laterally contracted between the
310 seeds, of a dark blackish brown colour; clothed with a few, short, white, compressed hairs. *Seeds* from eight to twelve, nearly circular, but much flattened, brown, and smooth.

It is cultivated throughout the Malay Islands for its roots, which resemble a turnip in taste, and consistence, and form part of their diet, no other part of the plant is eaten.

11. D. *gangeticus. Roxb.*

Biennial or perennial, twining, smooth. *Leaflets* lanceolate. *Peduncles* longer than the leaves, many-flowered. *Legumes* cylindric, reflexed, from six to eight-seeded.

Beng. Bun burbutee.

Found on the moist banks of the Ganges, where it flourishes during the cold season, and lasts at least two years.

Stems twining to a considerable extent, smooth. *Leaflets* ovate-lanceolate, sub-equal, entire, and pretty smooth, three inches long, by about one broad. *Petioles* channelled. *Stipules* small, adjoined, cordate. *Peduncles* axillary, solitary, erect, round, smooth, much longer than the leaves, each supporting a head of from four to eight large, yellow, short-pedicelled flowers. *Wings*, a remarkable long horn projects forward from near the base into the concavity formed by the calluses of the base of the banner. *Legumes* reflexed, cylindric, with a recurved conical point, a little curved, and with a few short, stiff hairs, which are readily removed by friction. *Seeds* six or eight, sub-cylindric, dark brown, size of a small pea. Cattle are fond of it, otherwise it is of no use that I can learn.

12. D. *prostratus. B. H.* and *Kön. Mss.*

Root tuberous. *Stems* twining, downy, herbaceous. *Leaflets* oval, silky underneath. *Racemes* shorter than the leaves. *Legumes* scimitar-shaped, three or four-seeded.

D. *ciliatus. Willd.* iii. 1049.

III. *Teling.* Canchi chikurkai.

311 An herbaceous species, common in hedges near the sea. Flowers during the cold season.

Root perennial, tuberous. *Stems* annual, twining, round, downy, branchy, from six to twelve feet long. *Leaves* ternate. *Leaflets* equal, oval, entire, margin and under side covered with much, silver-coloured hair, about two inches long, and one and a half broad. *Petioles* hairy, channelled. *Stipules* of the petioles cordate pointed; those of the leaflets lanceolate. *Racemes* axillary, generally shorter than the leaves, few-flowered. *Flowers* pretty large, sulphur-coloured. *Stigma* cordate, smooth. *Legumes* horizontal, scimitar-formed, smooth, from three to four-seeded.

13. D. *falcatus. Willd.* iii. 1047.

Root tuberous. *Stems* twining, smooth. *Leaflets* somewhat three-lobed, smooth. *Racemes* short, few-flowered; *Legumes* linear.

Phaseolus Madraspatensis. *Pluk. t.* 214. *f.* 3.

Glycine *triloba.* B. H. (i. e. *Sir J. Banks' herbarium.*)

D. *trilobus. Lour. Cochin Ch.* 535.

Teling. Itoo mungee tiga.

It is common in hedges, thickets, &c. where the soil is rich and moist. Flowers during the cold season.

Root perennial, tuberous, as thick as the thumb, or more. *Stems* herbaceous, from four to five feet long, twining, slender. *Leaves* ternate. *Leaflets* nearly equal, the lateral ones gibbous outwardly, the terminal one smooth on both sides, of a paler green or whitish in the centre, about an inch and a half each way. *Stipules* of the petioles oblong, pointed, reflexed; those of the leaflets subulate. *Peduncles* axillary, slender, from four to eight-flowered, umbel-like, bowing from the weight of the flowers. *Flowers* large, of a beautiful bluish purple. *Le-*
III. *gumes* linear, compressed, smooth, from four to eight-seeded.
312 The tuberous roots are cut by the natives into the form of beads, and strung and worn

* Can Loureiro's plant be the same? he says his is without stipules, and here they are pretty large and conspicuous.

round the neck to cure purging in children.

14. D. *glutinosus. Roxb.*

Annual, twining, the whole plant glutinous. *Racemes* longer than the leaves, with single, alternate yellow flowers. *Legumes* lanceolate, cuspidate, two-seeded.

Beng. Shim-bhatraji.

Teling. Kar-Kandi.

A native of hedges and unfrequented places; it is by no means a common species. Flowers during the cold season.

Stem biennial, or perennial, from four to five feet long, twining, downy; the young shoots are particularly so, and glutinous. *Leaves* ternate. *Leaflets*, the lateral pair have their outside remarkably large, and the inside lanceolate, the terminal one broad-rhombed, all are acute and covered with glutinous down. *Stipules* of the petioles cordate, spreading; those of the leaflets subulate. *Racemes* axillary, peduncled, longer than the leaves, erect, many-flowered. *Bractes* of the pedicel single, oval, concave, one-flowered, caducous. *Flowers* pretty large, yellow. *Banner* obcordate; the callosities are remarkably large. *Legumes* reflexed, a little lanceolate, protuberant, five-pointed, covered with much glutinous hair, two-seeded. *Seeds* kidney-form, shining, smooth, gray.

I know of no use to which this is put. Cattle do not eat it.

15. D. *pilosus. Willd.* iii. 1043.

Perennial, twining, very hairy. *Flowers* on short axillary racemes. *Wings* two horned. *Legumes* cylindric, pointed, very hairy, from eight to twelve-seeded.

Beng. Malkonia.

A rare annual species, found in hedges where the soil is good. Flowers during the cold season.

Stem perennial, twining, from three to six feet long, covered with much soft, white hair. III. *Leaves* ternate. *Leaflets* of the same general form of the rest of the family, but narrower, very 313 downy; about four inches long and one and a half broad. *Petioles* slightly channelled. *Stipules* small, lanceolate. *Peduncles* axillary, short-headed, many-flowered. *Bractes* as in the other species. *Flowers* large, of a beautiful blue colour. *Wings* about half the length of the banner and keel, broad, irregularly angle-lobed, keeled on the under side, and on the upper and inner angle. *Legumes* pendulous, very hairy, from four to five inches long, as thick as a goose-quill, straight, cylindric, intercepted between the seeds. *Seeds* from eight to twelve, reniform, shining black. Cattle eat the straw of this plant.

16. D. *biflorus. Willd.* iii. 1051.

Annual. *Stem* erect; *branches* twining, hairy. *Leaflets* oblong, pointed. *Flowers* axillary. *Legumes* scimitar-shaped, reflexed, hairy, from five to six-seeded.

Sans. Koolutthα.

Beng. Koolthee.

Teling. Woolawa the name of the plant, and woolawaloo the grain. Horse-gram plant on the Coromandel coast.

This species I have never found but in a cultivated state. It is annual.

Stem very short, erect; *branches* twining; tender parts hairy, the whole plant is from two to three feet high. *Leaves* ternate. *Leaflets* broad-lanceolate, or oblong, equal, entire, downy, about an inch long, and half inch broad. *Stipules* of the petioles oblong; of the leaflets subulate. *Flowers* axillary, small, sulphur coloured, generally each has its proper peduncle, though sometimes it is common to more flowers than one. *Bractes* lanceolate, one at the origin of each peduncle or pedicel, and two pressing the calyx laterally. *Calyx*, the upper lip slightly emarginate. *Banner* obcordate, emarginate. Wants the callous bodies. *Wings* linear. *Legumes*, direction various, scimitar-formed, compressed, about two inches long, and III. a quarter of an inch broad, hairy, with the point subulate, recurved. *Seeds* about six, compress- 314 ed, kidney-formed, gray.

This species is much cultivated all over the coast. It requires a dry, light, rich soil. In October and November, it is sown, either by itself, or mixed with *Holcus saccharatus*. The general harvest time is in February. The produce about sixty-fold in good soil, and favourable season.

Nella Woolawooloo is a most distinct variety of the above with jet black seeds. It is also cultivated.

The grain of both varieties is employed indifferently to feed cattle; however in times of scarcity the poor are glad to live upon it. In these parts it is the lowest priced of all the *leguminæ*, which enables them to procure it, when they cannot well procure any thing else. Cattle are fond of the straw of both sorts.

17. D. *Soja. Willd.* iii. 1051.

Annual, erect, flexuous, every part hairy. *Flowers* axillary, sub-racemous. *Corol* scarcely longer than the calyx. *Legume* reflexed, scimitar-shaped, from two to three-seeded.

Daidsee. *Kæmpf. amœn. p.* 837. *f.* 838. good.

Reared in the Honourable Company's Botanic garden, from seeds received from the Moluccas in 1798. It may be cultivated at all times of the year, consequently flowers at all times; but, like all the other leguminous tribe, succeeds best during the cold season.

Root ramous, annual. *Stem* erect, flexuous, very ramous near the base, hairy in every part; from one to four feet in height, but when high it requires support. *Leaves* long-petioled, ternate, hairy. *Leaflets* entire, ovate, the lateral ones broadest, and considerably oblique, the inferior side being much broader than the superior. *Flowers* axillary, sometimes on a common short peduncle, sometimes without it, and smaller than in any other species of *Dolichos*

Carey Ed. III. 315

I have yet met with; colour a reddish purple. *Bractes* small, hairy. *Corol* scarcely longer than the segments of the calyx. *Banner* vaulted, emarginate and closing the wings. *Carina, stamina,* and *pistillum* as in the genus.

18. D. *medicagineus. Willd.* iii. 1044.

Biennial, twining, downy. *Leaflets* roundish. *Peduncles* from two to three-flowered. *Legumes* always seeded.

Phaseolus exiguus. Burm. Zeyl. t. 84. *f.* 2.

Teling. Gadee chikurkai.

This is a small biennial species, a native of the greater part of the coast, growing in hedges, thickets, &c. It flowers during the cold season.

Stem woody, slender, branchy, extending only a few feet at most, tender parts downy. *Leaves* ternate. *Leaflets* nearly equal, oval, covered with much very soft, whitish down, veined, about three quarters of an inch long, and half an inch broad. *Stipules* of the petioles cordate, pointed; of the leaflets very minute. *Peduncles* axillary, short, generally two-flowered. *Flowers* small, yellow. *Calyx,* the upper part entire. *Banner,* the callosities are very sharp, and point directly downwards. *Filaments* alternately larger. *Legume* linear, compressed, downy, protuberant at the seeds, contracted and intercepted between them. *Seeds* from four to six; *hilum* remarkably large. Cattle eat it.

19. D. *scarabæoides. Willd.* iii. 1046.

Biennial, twining, downy. *Leaflets* oval. *Peduncles* two-flowered. *Legume* falcate, from four to five seeded.

Phaseolus minimus. Pluk. Alm. t. 52. *f.* 3. good.

Beng. Banur-kuluy.

This like the last species, is biennial, a native of the same parts, and has much the same appearance, but is considerably smaller.

III. 316

Leaves ternate. *Leaflets* nearly equal, orbicular, bullate, downy; about three eighths, or half an inch each way. *Stipules* of the petioles half-lanceolate, those of the leaflets minute. *Racemes* axillary, longer than the leaves, few-flowered. *Bractes* solitary, lanceolate, concave. *Flowers* yellow, small. *Legume* compressed, falcate, two-seeded. Cattle eat this sort, I know of no other use it is put to.

20. D. *Phaseoloides. Roxb.*

Perennial, twining, clothed with diverging hairs. *Leaflets* semi-cordate, and deltoid, or three-lobed. *Racemes* the length of the leaves. *Legumes* cylindric, toward the apex incurved, from ten to twenty-seeded.

From Mr. Kerr at Canton in China, the seeds were received into the Botanic garden in 1804; where the plants thrive well, and blossom chiefly about the close of the rains, and the seeds ripen about the beginning of the cool season.

Stem and *branches* perennial, twining, when they do not meet with support, they run on the ground, and strike root, round, and clothed with distinct, brown, diverging hairs. *Leaflets* the pair sub-semi-cordate, sometimes the posterior margin projects into a large rounded lobe, the terminal one deltoid, or three-lobed, all are hairy like the branches, generally from two to three inches long, and from one to two broad. *Petioles* very hairy, hairs harsh, and brown. *Stipules* of the petioles triangular, of the leaflets subulate. *Racemes* axillary, solitary, about as long as the leaves. *Flowers* numerous, pretty large, violet-coloured, and collected in bundles on alternate glands. *Bractes* of the gland three-fold, those of the flowers two-fold, all are very hairy, and ovate-lanceolate, the former caducous, the latter more permanent. *Calyx* somewhat bilabiate, the flower three-toothed, the middle tooth ends in a long filiform point, the upper bidentate. *Legumes* diverging, cylindric, towards the apex incurved, about as thick as a common quill, and from three to four inches long, black when ripe, and a little hairy. *Seeds* from twelve to twenty, smooth, small, brownish gray.

III. 317

21. D. *fabæformis. Willd.* iii. 1052.

Annual, erect. *Leaflets* ovate, dentate. *Stipules* subulate. *Racemes* axillary. *Legumes* straight, acute, three-keeled on the back, from ten to twelve-seeded.

D. *psoraloides. Lamarck. Encycl.* ii. 297.

Teling. Goor-chikurkai.

Psoralia *tetragonoloba. Mant.* 104. *Rich.* iii. 544.

Is an annual esculent plant, much cultivated in the gardens of the natives on the coast of Coromandel. I never saw it wild.

Stem annual, erect, branchy, irregularly angular from the insertion of the leaves, a little hairy, piped, about as thick as the little finger and about three feet high. *Leaves* alternate, ternate. *Leaflets* oval, acute, grossly serrate, on both sides are a few procumbent white hairs, with the under side slightly scabrous, from two to three inches long, and from one to two broad. *Petioles* three-sided, channelled. *Stipules* subulate. *Racemes* axillary, single, about as long as the petioles, many-flowered. *Flowers* rose-coloured, small, very short-pedicelled. *Bractes* single, each pedicel subulate. *Calyx,* under divisions largest. *Corol,* when it first opens, soon after sunrise, it has the general form of other papilionaceous flowers, but about ten o'clock they expand and appear angular, and four-petalled; the least touch hastens the change, and the petals fly open with a very smart elastic jerk, which produces a great discharge of dust from the anthers. *Legumes* erect, linear, pointed, compressed between the seeds, margin three-keeled. *Seeds* from eight to twelve.

The young tender legumes are much used by the natives in their curries, stews, &c. Cattle are also fond of the plant.

GLYCINE. Schreb. gen. N. 1182.

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Calyx two-lipped. *Keel* of the corol, reflecting the banner at top.

1. G. *debilis. Willd.* iii. 1060. III.

Half diffuse, half twining, hairy. *Leaves* ternate; *leaflets* round-obovate. *Racemes* axillary, intercepted. *Legumes* nearly straight, with an erect beak. 318

Sans. Masha puruee.

Beng. Mashanee.

Is a native of Bengal and other parts of India, but scarce. Flowering time the rains; the seed ripens during the cold season.

Root, (I believe) perennial. *Stem* none, but many slender, diffuse, hairy branches spreading on the ground, with twining extremities, when they meet with support. *Leaves* ternate. *Leaflets* roundish, obovate, hoary, and hairy underneath; veins parallel. *Petioles* channelled, hairy. *Stipules* of the petioles and leaflets ensiform. *Racemes* axillary, solitary, hairy, about as long as the leaves. *Flowers* in small, remote fasciculi, minute, of a deep reddish violet. *Legumes* nearly straight, hairy, beak erect. *Seeds* about six or seven.

2. G. *labialis. Roxb.*

Perennial, twining. *Leaves* ternate; *leaflets* ovate-oblong. *Filaments* alternately sterile. *Corol* nearly two-lipped.

A pretty extensive, shrubby species, common on banks of water courses, in forests, &c. Flowers during the rains.

Stem woody, twining, slender, a little hairy. *Leaves* ternate. *Leaflets* ovate, entire, a little hairy on the under side, of a deep green above about an inch and a half long. *Petioles* channelled. *Stipules* acute, hairy; those of the leaflets subulate. *Racemes* axillary, longer than the leaves, interrupted. *Flowers* numerous, small, rose-coloured, collected on the alternate glandular tuberosities of the raceme. *Calyx* hairy. *Banner* emarginate, with the sides reflected. *Wings* projecting, horizontal, hiding the keel, which makes the flowers appear two-lipped rather than papilionaceous; *keel* short, as if truncated. *Filaments* one and nine, alternately shorter and sterile. *Anthers* five, oval, incumbent on the five longer filaments. *Legumes* straight, short, round, erect, obtuse, strong pointed, from six to twelve-seeded. III.

3. G. *tenuiflora. Willd.* iii. 1059. 319

Perennial, twining, filiform. *Leaves* ternate; *leaflets* ovate-oblong, smooth. *Racemes* axillary, longer than the leaves. *Flowers* fascicled.

A rare plant, a native of low, rich pasture ground, among bushes, near Samulkota. Flowering time the rainy season.

Root woody, perennial. *Stem* or *branches* many, twining, filiform, round, slightly woolly when examined with a lens, from two to three feet long. *Leaves* ternate. *Leaflets* broad-lanceolate, obtuse with a small point, smooth, from one to two inches long. *Petioles* round, a little hairy. *Stipules* of the petioles acute, withering; those of the leaflets small, bristle-like. *Racemes* axillary, generally solitary, and larger than the leaves, interrupted. *Bractes* small, pointed, two pressing on the calyx. *Flowers* rose-coloured, collected in little heads of from two to four on the glandular tuberosities of the raceme. *Calyx* four-parted; *upper divisions* largest, pointed, resting on the banner. *Style* and *stigma* smooth. *Legumes* erect, compressed, from four to eight-seeded.

CYLISTA. Schreb. gen. N. 1759.

Calyx very large, four-parted; *upper division* cleft at the end. *Corol* permanent, legume two-seeded.

1. C. *tomentosa. Roxb. Ind. pl. N* 221.

Perennial, twining. *Divisions* of the *calyx* cuneate. *Legume* of one or two round lobes, with one round, blue-violet, highly polished seed in each.

Is a native of Ava, where it was discovered by Dr. Buchanan, and the seeds sent by him to the Botanic garden, where the plants thrive well, and blossom about the close of the rains, and during the cold season; the seed ripens in March and April.

Stem perennial, short, with but few stunted branches in its native, sterile soil, but in the Botanic garden the second year the branches lengthened much, and twined to a considerable extent, the young parts are round, and downy. *Leaves* ternate. *Leaflets* cordate, entire, downy, from two to three inches long, and from one to two broad. *Petioles* channelled, downy. *Stipules* of the petioles lanceolate; of the leaflets subulate. *Racemes* axillary, shorter than the leaves. *Flowers* yellow. *Calyx* to the base four-cleft, downy, permanent; *divisions* cuneate; the upper one broad, two-parted. *Corol* papilionaceous, shorter than the calyx, withering, but not dropping. *Legume* of one, or two, nearly spherical, villous lobes; when two, about as long as the calyx. *Seed* a single, round, highly polished, deep violet-blue one, of the size of a pea, in each lobe of the legume. III. 320

2. C. *scariosa. Willd.* iii. 1068. *Corom. pl.* 1. *N.* 92.

Perennial, twining. *Calyx* reticulate, scariose. *Seed* reniform, compressed.

This plant is perennial with a woody twining stem, a native of the mountainous parts of the Circars.

Leaves ternate. *Leaflets* entire, downy, pointed, the exterior one long rhombiform; the [illegible] *Racemes* axillary, erect, as long as the leaves. *Flowers* [illegible] the calyx, except just when expanded, and then only appearing in front. *Calyx* [illegible] four-parted, chaffy, slightly downy, beautifully reticulate with

Page Carey Ed. coloured veins; *upper division* shortest, broad, retuse; *under division* long, retuse; *lateral parts* smallest, cordate, all are permanent. *Corol, stamens,* and *pistillum* as in *Dolichos. Legumes* obliquely oval, downy, hid in the calyx. *Seed* one, flat, reniform.

CLITORIA. Schreb. gen. N. 1183.

III. 321 *Corol* supine; *banner* large, expanding under the wings.

1. C. *Ternatea. Willd.* iii. 1068.

Shrubby, twining. *Leaves* pinnate. *Peduncles* axillary, one-flowered.

Teling. Nella dintana, the blue flowered variety; and tella dintana the white.

Sans. Asphota, *U*parajita.

*Beng. U*parajita.

Flos cœruleus. *Rumph. Amb.* v. *t.* 31.

Schanga cuspi. *Rheed. Mal.* viii. *t.* 38.

Common in every hedge all over India, and in flower the greater part of the year. Its root probably is not inferior to jalap as a cathartic; the powdered seed is also purgative.

2. C. *heterophylla. Lamarck.*

Perennial, twining. *Leaves* pinnate. *Leaflets* three, five, seven, or nine, from round to linear.

It is in flower and seed the whole year. Its delicate twining habit, variously shaped leaves, and beautiful azure flowers render it very ornamental.

PISUM. Schreb. gen. N. 1184.

Style triangular, above keeled, pubescent. *Calyx* with the two upper segments shorter.

P. *sativum. Willd.* iii. 1070.

Petioles round. *Stipules* rounded at bottom and crenate. *Peduncles* many-flowered.

Hind. and *Beng.* Mutur, the Patna or common white field pea, and Choota Mutur a small, round greenish variety of the common gray field pea. The former is cultivated extensively in the fields about Patna; and to the westward; the other variety is cultivated in every part of Bengal during the cold season.

III. 322

LATHYRUS. Schreb. gen. N. 1186.

Style flat, villous above, broader upwards. Two superior divisions of the calyx shorter.

1. L. *Aphaca. Willd.* iii. 1077.

Peduncles one-flowered. *Tendrils* leafless. *Stipules* sessile, sagittate-cordate, and obtuse.

Beng. Musoor chuna.

Although the stipules do not agree perfectly with Miller's figure, which represents them acute and with short petioles; yet I think they can be nothing more than varieties of the same species.

The flowers of the Indian sort are yellow, the legumes flat, and with four or five seeds. Curtis's figure in his *Flora Londinensis* is more like our Indian variety in the stipulæ, but his legume has seven or eight seeds.

2. L. *sativus. Willd.* iii. 1079.

Stem climbing, smooth, four-seeded, with two of its angles winged. *Peduncles* one-flowered. *Tendrils* four-leaved.* *Stipules* adjoined, ovate-lanceolate. *Legumes* ovate-oblong, with a double keel on the back.

Beng. Kesari.

Is sown on a strong, rich soil, about the close of the rains, in October; the harvest is three or four months after. Like other leguminous plants, it affords much wholesome, green fodder for cattle; and the seeds, when the plant is suffered to remain till they are ripe, are used in diet by the natives.

III. 323

VICIA. Schreb. gen. N. 1187.

Stigma transversely bearded on the lower side.

1. V. *sativa. Willd.* iii. 1104.

Procumbent, angular. *Tendrils* with from four to six pair of sub-opposite, retuse, from linear to obcordate leaflets. *Stipules* adjoined, marked underneath. *Flowers* always solitary, sessile. *Legume* horizontal, cylindric, from six to eighteen seeded.

Beng. Ankari.

A native of Bengal and the provinces to the northward. When young the mark on the under side of the stipules is a glandular concavity, filled with a pellucid liquid, which dries up as the stipules get old, leaving a brown mark only.

It is seldom or never cultivated in Bengal, but is common in its wild state. When it meets with a suitable soil, it spreads over a full yard of surface, with numerous succulent branches and leaves, which cattle are fond of.

2. V. *Faba. Willd.* iii. 1111.

Stem upright; *petioles* without tendrils.

* I have seen a whole field with two pair of leaflets to the tendril; and near it another, in which there were only one pair; the former by far the most luxuriant of the two, though in soil there appeared to be no difference whatever.

A small, smooth, brown-seeded variety of the *Faba minor* or *Horse bean*, is found in a cultivated state in Nepal, and from thence it has been introduced into the gentlemen's gardens at Purnea, and from thence into the Botanic garden, where it thrives luxuriantly during the dry season. Page Carey Ed.

ERVUM. Schreb. gen. N. 1188.

Calyx five parted, the length of the corol. *Stigma* capitate, hairy.

E. *hirsutum. Willd.* iii. 1113.

Peduncles many-flowered. *Legumes* hairy, with two round seeds. *Leaflets* linear, smooth. III. 324

Beng. Musoor chuna.

Hind. Jhunjhuni-ankari.

Stems numerous, slender, four-sided, smooth. *Peduncles* shorter than the leaves, from three to six-flowered. *Tendril* three-cleft, from ten to twelve-leaved. *Leaflets* sub-alternate, linear, smooth. *Stipules* subulate, often pinnatifid. *Legumes* hairy, two-seeded. *Seeds* globular.

This is a small, delicate annual, a native of Bengal. It appears during the cold season on cultivated lands. In the interior provinces it is cultivated for fodder.

CICER. Schreb. gen. N. 1189.

Calyx five-parted, the length of the corol; the four segments incumbent on the banner. *Legume* rhombed, turgid, two-seeded.

1. C. *arietinum. Willd.* iii. 1113.

Leaflets serrate.

Chick pea.

Sunaga, the Telinga name of the plant, and Sunagalloo the grain.

Beng. Boot, Boot kuluy, or Chola.

Very universally cultivated throughout India during the cold season.

2. C. *Lens. Willd.* iii. 1114.

Erect, ramous, pubescent. *Stipules* lanceolate, entire. *Peduncles* two-flowered, with an abortive pedicel. *Calyx* rather longer than the corol. *Legume* two-seeded.

Beng. and *Hind.* Mussoor.

This plant is cultivated to considerable extent by the natives of Bengal, and other adjoining provinces, during the cold season.

Stem short, erect, very ramous. *Branches* sub-erect, angular, downy; whole plant from one to two feet high. *Leaves* alternate. *Leaflets* from four to six pair, sub-opposite, lanceolate, pubescent. *Petioles* ending in a short, simple tendril, which does not take hold of any thing to support the plant. *Peduncles* axillary, the length of the leaves, each supporting two small white flowers, and then ending in a short filament beyond them. *Calyx* rather longer than the corol. *Stigma* somewhat villous before. *Legume* rhomboidal, smooth, containing two, round, compressed, gray, minutely spotted seeds. The seeds form an article in the diet of the natives. III. 325

CYTISUS. Schreb. gen. N. 1191.

Calyx two-lipped; *upper division* two-parted; the *under* one three-toothed. *Legume* attenuated at the base.

C. *Cajan. Willd.* iii. 1121.

Racemes axillary, erect. *Leaflets* sub-lanceolate. *Legume* pointed, and obliquely grooved between the seeds.

Thora-poru. *Rheed. Mal.* vi. *t.* 13. *Burm. Zeyl. t.* 57.

Beng. Urhur.

Teling. Pedda Candi is the name of the large sort, and Pedda Kandiloo the grain.

It is much cultivated; and it is only in that state that I have ever found it. To appearance it is a large shrub, of some years' duration, however with the greatest care it seldom lives longer than two or three. The natives call it annual, because they do not find it bear well the second year; of course, after collecting the first crop, they pull it up for firewood, &c.

Stem short but straight, woody, often as thick as a man's leg, very ramous. *Branches* ascending, striated from the insertion of the leaves; height of the whole plant from five to ten feet. *Leaves* ternate. *Leaflets* oblong, equal, entire, acute, soft, downy, below whitish, about two inches long, and one and three quarters broad. *Petioles* channelled, striated. *Stipules* cordate, pointed, withering. *Racemes* axillary, as long as the leaves, erect, a little downy. *Bractes* oblong, concave, pointed, downy, two-flowered. *Flowers* pretty large, yellow. *Filaments* alternately longer; *anthers* equal. *Legume* globularly protuberant at the seed, the contractions between them oblique; downy, spotted with dark purple; about an inch long. *Seeds* three or four, of the size of a small pea, round, smooth, light brown. Beside the above described, there is a smaller variety; they differ however only in appearance and size, the first growing to be from six to eight feet high, with a circumference of twenty feet round the extremities of the branches. The second seldom or never more than half the size; but they differ more in respect to the length of time they take to ripen their seeds, the first requiring about nine months from the time it was sown, and yielding a produce of about six hundred-fold. The other, only three months, and yielding generally less than one hundred-fold. III. 326

They both require a high, dry, light, rich soil. The first sort is commonly sown, with the first rains, in June; the second about September.

Page Carey Ed. This grain is in high esteem by all classes of the natives; it holds the third rank amongst the leguminous seeds, and is next in value after the Chick Pea.

Cattle are fond of the tender parts of the plant, whether green or dry. The dry wood is excellent fuel, beside it is one of the best for producing fire by friction. The natives say there is a third sort cultivated on the high hills which form the north boundary of the Circars, but I have never been able to meet with it.

ROBINIA. Schreb. gen. N. 1194.

Calyx campanulate, division of its mouth unequal and generally four. *Legume* gibbous at the seeds, elongated.

III. 327

1. R. *candida. Roxb.*

Shrubby, erect, unarmed. *Leaves* unequally pinnate ; *Leaflets* ten-paired, lanceolate. *Racemes* terminal or axillary. pedicels one-flowered. *Legumes* linear, many-seeded.

This elegant, large shrub, was first reared in the Company's Botanic garden, from seed collected in the north of Bengal by Dr. Carey. Flowering time the cold season.

Stem erect, ligneous ; *branches* expanding ; the young parts villous, and clouded with dark and brighter green ; the woody parts smoother and ash-coloured ; the whole height when full grown from five to eight feet. *Leaves* alternate, unequally pinnate, from six to eight inches long. *Leaflets* opposite, short-petiolated, generally from ten to twelve, linear-lanceolate, entire, dagger-pointed, villous underneath, and on the margins, about two inches long. *Petioles* villous, channelled. *Stipules* tapering to a fine long point. *Racemes* terminal, and axillary, short, few-flowered. *Pedicels* one-flowered, nodding. *Bractes* small, caducous, flowers large, pure white, inodorous. *Banner* covered with gray down on the back, pure white and smooth within. *Legume* linear, many-seeded.

2. R. *suberosa. Roxb.*

Arboreous; *bark* suberous, deeply cracked. *Racemes* terminal ; *pedicels* one-flowered. *Leaflets* from five to seven paired, with an odd one. *Legume* linear, many-seeded.

For this beautiful plant we are also indebted to Dr. Carey, who sent the seeds from the district of Dinajpoor, to the Botanic garden at Calcutta, where it grows well and is in blossom during the rains chiefly.

Trunk erect, soon branching out into a large ramous head, whole height of the plant when full grown eight or nine feet. *Bark* ash-coloured, that of the trunk deeply split and of a corky nature. *Leaves* alternate, abruptly pinnate. *Leaflets* from five to six pairs, opposite

III. oblong, entire, above smooth, underneath hoary, the largest exterior ones about an inch long.
328 *Stipules* minute, caducous. *Flowers* large, of a deep rose-colour, collected on terminal racemes, each furnished with a long pedicel. *Calyx* four-parted, the upper division more removed and two pointed. *Legume* about four inches long, linear, compressed, with six or eight flattened reniform seeds.

It is a very ornamental plant, particularly while young.

3. R. *Sennoides. Roxb.*

Shrubby, unarmed. *Leaflets* from eight to ten pair, lanceolate. *Racemes* terminal. *Flowers* large, blue, three-fold. *Calyx* four-toothed.

Cytisus *sericeus. Willd.* iii. 1121.

A native of the Circars ; flowering in the hot season.

4. R. *fruticosa. Roxb.*

Shrubby, ultimately twining. *Leaflets* from three to four pair with a terminal one, linear oblong. *Racemes* axillary. *Banner* with two callosities at the base. *Legume* flat, from four to six-seeded.

A native of the interior parts of Bengal. From Chupra Mr. Charles Boddam sent seeds to the Botanic garden in 1803, where the plants blossom during the rains, and ripen their seed in January.

Trunk short. *Branches* erect, the longest shoots began to twine in plants of four and five years of age, when they were not more than from three to six feet high. *Bark* of the older ligneous parts somewhat scabrous, that of the tender shoots villous. *Leaves* alternate, unequally pinnate, from six to twelve inches long. *Leaflets* from three to five pair, opposite, linear oblong, those nearest the apex and particularly the terminal one, cuneate, all are entire, obtuse, and nearly smooth on both sides, from two to six inches long, and about one and a half broad. *Petioles* common, villous and slightly channelled, much swollen at the base. *Sti-*

III. *pules* of the petioles triangular, those of the leaflets subulate. *Racemes* or rather *spikes* axil-
329 lary, generally single, and simple, much shorter than the leaves. *Flowers* sub-sessile, middle sized, rose-coloured, always in pairs, from round, elevated glands. *Bractes* tern, a small and cordate one below each gland which is persistent; and two lateral on the gland, which are caducous; besides there are two to each calyx, which press on its base laterally. *Calyx* somewhat gibbous, four-toothed, the upper one broader, shorter and emarginate. *Banner* with two remarkable callosities rising from the base in the inside. *Filaments* one and nine. *Anthers* equal, roundish. *Germ* inserted into a cup-shaped nectary with the filaments. *Stigma* naked. *Legume* linear-lanceolate, thin, from four to six-seeded.

5. R. *macrophylla. R.*

Shrubby, scandent, unarmed. *Leaves* unequally pinnate; *leaflets* from three to four, sub-obovate, oblong. *Racemes* axillary; *pedicels* one-flowered. *Banner* sub-rotund, deeply emarginate, with two short callosities at the base. *Legume* linear, flat, downy.

A native of the exterior parts of Bengal, where it grows to be large, woody, and scan-

dent. Flowering time in the Botanic garden, June and July; the seeds ripen in April. Page Carey Ed.

6. R. *ferruginea.*

Shrubby, the tender parts clothed with ferruginous down. *Leaves* unequally pinnate; *leaflets* seven or nine, linear-oblong. *Panicles* terminal and axillary; *flowers* sub-fascicled.

A very ramous scandent shrub, a native of Silhet, where it flowers in April.

7. R. *racemosa. R.*

Shrubby, climbing. *Leaflets* six-paired, with a terminal one; *stipules* subulate. *Racemes* nearly as long as the leaves, many-flowered. *Legume* pendulous. *Seed* from five to six, remote.

Teling. Galuga. III.

A large climbing shrub; a native of the extensive forests among the Circar mountains. 330

Stem woody, climbing over trees, &c. *Bark* scabrous with a gray roughness. *Leaves* erect, alternate, pinnate with an odd one, about nine inches long. *Leaflets* opposite, six pair, oval, acute, entire, smooth; two inches long, and one broad. *Petioles* round, smooth. *Stipules* of the petioles and leaflets awled, shorter than the leaves. *Racemes* axillary, erect; many-flowered. *Bractes* awled, one-flowered. *Flowers* numerous, large, rose-coloured. *Calyx* slightly five-toothed. *Banner* emarginate. *Wings* falcate. *Nectary*, a crenulated cup surrounding the base of the germ, as in some species of *Dolichos*. *Legumes* straight, pendulous, from six to nine inches long, and as thick as the forefinger, very protuberant at the seeds, and perfectly compressed between them. *Seeds* remote, from five to six, oblong.

I do not know of any use to which any part of this plant is put.

AESCHYNOMENE. Schreb. gen. N. 1202.

Calyx bilabiate. *Filaments* simple, nine-cleft. *Legume* long, straight, slender and acute, with a partition between the seeds.

Note. So far do I agree with Gærtner in the division of this genus, as to consider the only two species I have yet found in India, with articulated legumes, *Hedysarums*. But the other species with long, slender, torulose pods, intercepted between the rather remote seeds (and void of every appearance of a joint, or articulation between them) I shall consider to belong to the family in which they have hitherto been placed, but under an *essential generic* character considerably altered.

1. A. *grandiflora.* III.

Unarmed, arboreous. *Leaflets* ten-paired. *Peduncles* from two to three-flowered, pendulous. 331 *Calyx* of two entire lips. *Legumes* pendulous, very long, linear; the *upper margin* broad and channelled, many-seeded.

Coronilla *grandiflora. Willd.* iii. 1145.

Agati. *Rheed. Mal.* i. *t.* 51.

Sans. Buka.

Beng. Buka, also Augasta.

Hind. Basna the red-flowered variety, and Sada basna the white.

Tam. Agati.

Teling. Yerra avesi the name of the red-flowered variety, Tella avesi the white-flowered.

A small, delicate, but high, viz. from twenty to thirty feet, tree of only a few years' duration. It is generally found in the vicinity of villages, where the natives encourage its growth for the sake of the leaves and tender pods which they use in their curries. It is in flower and fruit most part of the year.

Trunk straight, from ten to twelve feet high. *Bark* pretty smooth. *Branches* thinly scattered. *Leaves* alternate-abruptly pinnate, from six to nine inches long. *Leaflets* opposite, from eight to twelve pairs, linear-oblong, obtuse, entire, smooth, of a whitish-green, about an inch long, and three-eighths broad. *Stipules* of the petioles half lanced, caducous; those of the leaflets minute. *Peduncles* axillary, short, somewhat downy, from two to four-flowered; *pedicels* peduncle-like. *Bractes* minute, falling. *Flowers* very large, red or white. *Calyx* two-lipped; *lips* entire. *Banner* erect, oval. *Anthers* linear. *Legumes* pedicelled, from twelve to eighteen inches long, and about as thick as a common quill, pointed, a little compressed; the upper suture channelled, protuberant at, and intercepted between the seeds, but not in the least jointed. *Seeds* numerous, kidney-formed.

The tender leaves and young legumes are much used in food, by all classes of the natives. III.

The tree is employed for training the *Betle* plant *(Piper betel)*, it admits of the sun's 332 beams, and the wind, better than any other of its height, being thin of branches and leaves, particularly after it is more than one year old. It is of a very quick growth, which is another reason for employing it. The wood is only fit for fuel. Cattle eat the leaves and tender parts.

2. A. *sesban.*

Unarmed, arboreous. *Leaflets* about fifteen pair. *Racemes* pendulous. *Legumes* filiform, pendulous.

Kedangu. *Rheed. Mal.* vi. *t.* 27.

Emerus. *Burm. Zeyl. t.* 41.

Sans. Jayunti. See *Asiat. Res.* iv. *p.* 297.

Beng. Jayunti.

Coronilla sesban. *Willd.* iii. 1147.

It [illegible] an articulate legume, as stated by the accurate Vahl, *(Symb.* i. *p.* 54.) this cannot be it.

Teling. Suiminta.

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This small beautiful tree is in general found in the vicinity of villages, and is likewise of few years' duration. Flowers chiefly during the wet and cold seasons.

Trunk erect, about eight feet high. *Bark* cracked. *Branches* numerous, extremities twiggy, and often bowing. *Leaves* abruptly pinnate, from four to six inches long. *Leaflets* opposite, from ten to twenty pair, linear-obtuse, smooth, entire, about an inch long, and one-third of an inch broad. *Stipules* very acute, reflexed. *Racemes* axillary, pendulous, from eight to twelve-flowered. *Flowers* large ; of a beautiful dark purple with yellow spots.

There is a variety of this tree with yellow flowers which is not so elegant as the above described. I have also seen another with red flowers.

III. The wood is said to make the very best charcoal for gunpowder.

333 3. A. *spinulosa. Roxb.*

Annual, sub-ligneous, erect; armed with inoffensive prickles. *Leaflets* from twenty to forty pair ; *petioles* armed on the under side. *Legumes* erect, filiform,

Coronilla *aculeata. Willd.* iii. 1147.

Teling. Yerra-Jelooga.

A large shrubby-like annual, growing to be four or five feet high. It appears in rice fields during the rainy season. Flowers in December and January.

Stem erect, woody, annual. *Branches* remote, slender ; *bark* reddish, covered with many small, inoffensive prickles. *Leaves* abruptly pinnate, from three to twelve inches long. *Leaflets* opposite, numerous, *i. e.* forty pair, linear, obtuse with a minute bristle, smooth, half or three quarters of an inch long, and one-eighth broad. *Petioles* armed on the under side with inoffensive prickles, like those of the stem and branches. *Stipules* linear, very sharp, falling. *Racemes* axillary, many times shorter than the leaves, spreading. *Flowers* few, yellow, middle sized. *Legumes* erect, sharp-pointed, about as thick as a pack thread, and eight or nine inches long, protuberant at the seed, but not jointed. *Seeds* kidney-form.

4. A. *paludosa. Roxb.*

Annual, sub-ligneous, erect. *Leaflets* from ten to twenty pair. *Racemes* longer than the leaves, drooping, many-flowered. *Legumes* linear, pendulous.

Beng. Kathsola.

This is a very large annual species ; it has the appearance of an elegant tree, often twelve feet high, is a native of wet marshy places about Calcutta ; it appears during the rains.

Root annual, spindle-formed, with some few lateral branches. *Stem* erect, ramous ; all the parts under water are much swelled and are there of an exceeding light spongy texture,

III. but not piped ; these parts emit numerous, ramous, filiform roots, from every part, and except

334 for the insertions of those radicles the bark is continuous, smooth, and green in most parts, the parts above the water contract to about a third the thickness of those that are immersed, and are covered with smooth, shining, green bark ; height of the whole plant from six to twelve feet, the relative proportion of the immersed and exposed parts depends on the height of the inundation. *Leaves* sessile, abruptly pinnate, linear, from six to twelve inches long, horizontal, courting the solar light through the day, and drooping in its absence. *Leaflets* generally opposite, sessile, from ten to thirty pair, tapering a little from the base, where they are broadest, to the apex, rounded at both ends, with a bristle-like point, smooth above, and having a few hairs below, from an inch, to an inch and a half long, and three-eighths of an inch broad at the base. *Petioles* swelled at the glandular base, channelled ; *channel* hairy. *Stipules* half lanceolate, falling ; those of the leaflets subulate, permanent, minute. *Racemes* axillary, peduncled, solitary, drooping beautifully, from eight to twelve-flowered, longer than the leaves which they accompany. *Flowers* drooping, as large as those of Spanish broom, of a bright yellow, with the back of the banner spotted with distinct, round, purple dots. *Bractes*, those of the pedicel solitary, those of the calyx two, pressing on it laterally, all are boat-shaped and deciduous. *Calyx ; corol, &c.* as in A. *Cannabina.*

5. O. *Uliginosa. Roxb.*

Annual, diffuse ; *leaflets* forty pair. *Racemes* sub-sessile, erect, from six to eight-flowered. *Legume* erect, cuspidate.

It is a native of marshy places near Calcutta, appearing and flowering in the rains.

Stems annual, ramous, spreading. *Branches* sometimes slightly and remotely murexed, as in A. *procumbens*, which it resembles much ; *leaflets* from thirty to fifty pair, linear, with a point, and bright red margins, smooth on both sides. *Stipules* as in the other species. *Racemes* axillary, sub-sessile, from six to eight-flowered. *Flowers* short-pedicelled, approxi-

III. mate. *Banner* and *wings* yellow ; *keel* purple.

335 *Note.* The parts under water are swelled, like those of the last described species. It differs from O. *procumbens*, in having twice the number of leaflets to the leaf, and more than twice the number of flowers on the raceme.

6. O. *Cannabina* of *König.* See *Retz. Obs.* v. 26.

Annual, straight. *Leaflets* from twenty to forty pair. *Racemes* axillary, few-flowered. *Legumes* long, slender, somewhat four-sided.

Coronilla *Cannabina. Willd.* iii. 1148.

Beng. Dhunchi.

An annual species which I have not found wild. It is cultivated in various parts of Bengal for the fibres of its bark, which form a coarse substitute for hemp. The general seed time is in April ; it is in flower four or five months after.

Root ramous, annual in a cultivated state. *Stem* simple, from six to twelve feet high, and about as thick as the little finger, smooth, towards the base somewhat woody, ramous near the top only, the most tender shoots are slightly striated, and a little hairy. *Leaves* sub-sessile,

alternate, spreading in the day, pinnate, from six to twelve inches long. *Leaflets* from twenty to forty pair, opposite, rarely alternate, short-petioled, exactly linear, rounded at both ends, with a bristle-like point, having the upper side smooth, and the under one pale, with a few white hairs, from an inch to an inch and a half long, and about a quarter of an inch broad. *Petioles* slightly channelled, and a little hairy, with a swelled base. *Stipules* of the leaf half-lanced, falling; those of the leaflets awled, permanent. *Racemes* axillary, peduncled, solitary, shorter than the leaves they accompany, bearing from two to six pedicelled, nodding flowers. *Flowers* about the size of a pea blossom, yellow, with many dark purple spots. *Bractes* of the pedicels solitary, boat-shaped, hairy, caducous; those of the flower two, linear, pressing on the calyx, caducous. *Calyx* gibbous, five-toothed, sub-equal. *Corol* papilionaceous. *Banner* obcordate, bright yellow on the inside, and beautifully marked with purple dots on the outside. *Wings* obovate, oblong, obtuse, yellow. *Keel* obtuse, daggered behind. *Filaments* alternately shorter, simple, and nine-cleft. *Anthers* round, incumbent. *Germ* cylindric, smooth. *Stigma* emarginate. *Legume* tending to be pendulous, from six to nine inches long, linear, somewhat angular, about as thick as a very slender quill, many-seeded. *Seeds* sub-cylindric, smooth, of a light brownish colour.

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Cultivation of the Dhunchi plant, *Aeschynomene Cannabina, Kön.* in *Retz. Obs.* v. 26. *Coronilla Cannabina. Willd.* iii. 1148.

The soil generally employed for this plant about Calcutta, is wet and considerably lower than what is necessary for *Corchorus olitorius* and *capsularis*, and *Crotalaria juncea.** The preparation of the ground need not be so much attended to, as the plant is hardy, and the growth so rapid, as to destroy or keep down weeds of all kinds very completely. This, together with the crop being considered a meliorating one, renders it advantageous, notwithstanding the cheapness of the material. The time of sowing is when the soil has been moistened with the showers which fall during the storms called *north-westers* in May, which correspond with the *tornados* on the west coast of Africa. About fifteen seers, or thirty pounds, of seed to the acre is generally allowed, and less attention is paid to the weeding than is necessary for *Corchorus*. In September and October the crop is ready to cut, though the fibre does not suffer if left standing till the seed is ripe in November. The process of steeping and cleaning the fibre, is exactly similar to that already described for *Crotalaria juncea.*

The general produce of an acre is from one hundred, to one thousand pounds of ill cleaned fibre; the current price somewhat less than *Paat*, viz. *Corchorus*. Expense of cultivation, including land-rent, about nine Rupees.

III. 337

This is deemed the coarsest, though not the least durable of our Bengal substitutes for hemp. It is reckoned to be more durable in the water, or for purposes where it is often wet, than either *sun*, or *paat*; and is therefore universally employed for the drag ropes, and other cordage about fishing nets. The nets themselves are made of *sun twine*, well tanned with the bark of a species of *Rizophora.*

7. O. *procumbens. R.*

Annual, diffuse, somewhat armed with inoffensive prickles. *Leaflets* minute, about twenty pairs. *Peduncles* axillary, short, from two to three-flowered. *Legumes* linear, erect, cuspidate.

Teling. Manchi Jelooga.

A native of Coromandel; appearing on wet pasture land, borders of rice fields, &c. in the rainy season.

FLEMINGIA. R.

Calyx five-cleft. *Stamina* one, and nine. *Legumes* sessile, oval, turgid, two-valved, one-celled, containing two spherical seeds.

This genus assigned to the name of Dr. John Fleming, Physician General in Bengal, consists of shrubby *Hedysarum*-like plants, natives of various parts of India. They are all perennial, the young shoots generally three-sided.

Leaves ternate; *leaflets* three-nerved. *Petioles* more or less winged, opposite, scariose. *Stipules* as in the *Hedysarums. Flowers* on axillary, or terminal, simple or compound racemes or panicles. In all the corol is pink, striped with yellowish purple lines. The essential mark is in the sessile, turgid, oval legumes, with regularly two round seeds in each.

III. 338

1. F. *procumbens. Roxb.*

Perennial, procumbent, three-sided, particularly when dry. *Racemes* axillary, the length of the leaves. *Legumes* and *calyx* besprinkled with garnet-coloured grains.

A native of the mountains north of Oude, and Rohilcund. In the Botanic garden it blossoms throughout the dry season.

Root perennial. *Stem* none, but many ramous, three-sided, villous, somewhat ligneous branches, springing from the crown of the root, and spreading flat on the ground, their length, in two years old plants, from one to two feet. *Leaves* ternate. *Leaflets* entire, villous underneath, somewhat three-nerved, and marked throughout with veins, the pair obliquely oval, the terminal one obovate. *Stipules* paired, stem-clasping, villous, caducous. *Racemes* axillary, generally solitary, about the length of the leaves, their upper half thickly set with short-pedicelled, small flowers, strongly marked with deeper coloured purplish lines. *Bractes* of the pedicel about as long as the pedicel, oblong, one-flowered, caducous; those of the calyx subulate, very small and also caducous. *Calyx* deeply five-cleft, hairy and marked with garnet-coloured glands on the outside. *Banner* roundish, strongly marked with deeper and lighter

* See the method of cultivating those plants in the *Fourth Report of the African Institution* and in the *Transactions of the Society of Arts, vol.* xxii. and xxiv.

Page Carey Ed. coloured lines; *wings* purple; *keel* pale rose. *Stamens* one, and nine. *Anthers* ovate. *Stigma* large, capitate. *Legume* sessile, oval, besprinkled with garnet-coloured glands, one-celled. *Seeds* two, spherical, gray, speckled with blackish brown.

2. F. *prostrata. Roxb. Jun.*

Somewhat shrubby, prostrate; *young parts* three-sided, and downy. *Leaflets* lanceolate, acute. *Racemes* axillary, solitary, length of the petioles. *Legume* villous.

This species was raised from seed sent by Mr. Kerr from China to the Botanic garden in 1805, where they blossom about the close of the rains, in November, and ripen their seed during the cool season.

III. 339 *Root* perennial. *Stem* scarcely any. *Branches* procumbent; the older woody parts thereof round, the tender ones somewhat three-sided, and clothed with villous pubescence, their general length about two feet and a half. *Leaves* ternate as in the other species. *Leaflets* lanceolate, the pair obliquely so, acute, entire, three-nerved, slightly villous underneath; three or four inches long, and less than one broad. *Petioles* three-sided; angles sharp and ciliate. *Stipules* opposite, lanceolate, cuspidate, half the length of the petioles, villous, caducous. *Racemes* axillary, solitary, villous, becoming rather longer than the petioles by the time the flowers have expanded. *Bractes* solitary, one-flowered, lanceolate, clothed with silky hairs, caducous. *Flower* small, a mixture of pale yellow and purple. *Calyx* hairy, five-parted, clothed with long fine white hairs; segments acute, the lower one twice the length of the other four. *Legume* oval, two-seeded. *Seeds* round, dark brown, spotted with gray.

3. F. *nana. Roxb.*

Suffruticose, with a very short, ligneous stem, and few short branches. *Leaves* ternate. *Leaflets* sub-obovate; *petiole* winged. *Racemes* axillary, crowded. *Legume* covered with red clammy glands.

Hind. Supta Cusunt.

This beautiful, small, sub-herbaceous species was found by Col. Hardwicke in various parts in the vicinity of the Ganges toward Hurdwar, and by him introduced into this garden, where it blossoms about the beginning of the hot season.

Stem scarcely any, a short, perennial, ligneous stump, of scarcely an inch in length, is all that appears above ground, from which issue a few short, sub-herbaceous branches, the whole height, leaves included, not above six or eight inches. *Leaves* ternate, long-petioled. *Leaflets*, the pair obliquely oblong; the terminal one obovate; all are three-nerved and a little downy, from one to three inches long. *Petioles* as long, or longer than the leaflets, winged. III. 340 *Stipules* ensiform. *Racemes* axillary, sub-sessile, from one to several together. *Bractes* solitary, lanceolate, one-flowered. *Flowers* numerous, pedicelled, small, pale greenish pink, with deeper stripes. *Calyx* unequally five-cleft, besprinkled on the outside with numerous, minute, clammy, ferruginous glands. *Legume* oval, densely clothed with clammy reddish glands, as are, in some measure, the pedicels and racemes also.

4. F. *conjesta. Roxb.*

Shrubby, sub-erect. *Leaflets* broad lanceolate. *Racemes* axillary, sub-sessile, heaped.

Beng. and *Hind.* Bura salpan.

This species is a native of the Delta of the Ganges. Flowering time the cold season; the seed ripens in two or three months afterwards.

Stems several, oblique, woody; *young parts* villous. *Branches* few, general height of the whole plant from three to six feet. *Leaves* ternate. *Leaflets* short-petioled, three-nerved, entire, pretty smooth above, villous underneath, the terminal one broad-lanceolate; the lateral ones of nearly the same size, and shape, but broader at the base and less distinctly marked with the three nerves, about six or eight inches long. *Petioles* nearly round, and villous. *Stipules* rather short, tapering from a broad base to a fine point. *Racemes* axillary, generally crowded, about as long as the petioles. *Bractes* shorter than the calyx, one-flowered, caducous. *Flowers* very numerous, and beautifully striated with orange and purple. *Legume* the length of the lower division of the calyx, sub-reniform, one-jointed, two-seeded.

This species has much the habit of my F. *stricta*, but differs widely in its specific character. In this the racemes are crowded, in that single; in this the bractes are shorter than the flowers, in that several times longer.

III. 341 5. F. *semialata. Roxb.*

Shrubby, ramous. *Leaves* ternate. *Leaflets* oblong, acute, three-nerved; *petioles* winged. *Racemes* terminal, and axillary, panicled.

A native of Nepal, from thence Dr. Buchanan sent the seed to this garden, where in little more than one year, the plants were tall, elegant, ramous, stout, erect shrubs, with the bark of the ligneous parts dark brown, and smooth, of the tender parts villous. *Leaves* ternate. *Leaflets* nearly equal, broad-lanceolate, entire, fine-pointed, smooth on both sides, from four to six inches long, and from one and a half to two broad. *Petioles* shorter than the leaves, with broad membranaceous villous margins. *Racemes* axillary, and terminal, generally compound, particularly the terminal ones, and they are often panicled. *Bractes* chaffy, lanceolate, one-flowered, caducous. *Flowers* numerous, large, rose-coloured, striated with greenish yellow, and purple. *Calyx* villous; *segments* five, nearly equal, ensiform, about as long as the corol. *Filaments* one and nine. The single one greatly enlarged near the base. *Legume* sessile, oval, slightly villous, turgid, the size of a field bean. *Seeds* small, perfectly round, smooth, shining black.

6. F. *lineata. R.*

Shrubby, erect, ramous. *Leaflets* obovate-cuneate, three-nerved, and strongly marked with veins. *Stipules* stem-clasping, scarious. *Racemes* axillary, long-peduncled, sub-secund,

often compound. *Legumes* villous, and mealy. Page Carey Ed.

Heydysarum lineatum. *Linn. Burm. Fl. Ind.* 167. *t.* 53, *f.* 1.

A native of the Peninsula of India. Flowers during the rainy and cold seasons.

7. F. *angustifolia. R.*

Shrubby, straight. *Leaflets* lanceolate, villous underneath. *Racemes*, or heads, terminal, and from the exterior axills, solitary, sessile, scarcely the length of the petioles. *Legumes* villous. III.

This species was discovered by Colonel Hardwicke growing in the vicinity of Hurdwar. 342

8. *F. stricta. Roxb.*

Stems many, shrubby, straight. *Leaves* ternate; *leaflets* broad-lanceolate, smooth. *Racemes* axillary, erect. *Stipules* and *bractes* lanceolate, caducous. *Legume* smooth.

A large shrubby species, a native of the mountainous parts of the coast. Flowers during the cold season.

Stems numerous, erect, with very few branches, which are also erect. *Bark* smooth. *Leaves* alternate, petioled, ternate. *Leaflets* nearly equal, broad-lanceolate, entire, fine pointed, a little wrinkled, about nine inches long and three broad. *Petioles* three-sided; upper side even, the lateral faces striated. *Stipules* of the petioles sheathing, remarkably large, surrounding the extremities of the branches, and overlapping each other, falling; those of the leaflets wanting. *Racemes* axillary, solitary, erect, the length of the petioles, short-peduncled, the peduncle is hid in large sheath-like bractes, and every part above is imbricated with the flowers. *Bractes* of the flowers solitary, lanceolate, one-flowered, falling. *Flowers* very numerous, beautifully striated with red, yellow, and violet. *Legumes* not jointed, oval, pointed, two-seeded; *seeds* spherical.

This plant has flowered in my garden for several years, it is pretty only when in flower.

SMITHIA. Schreb. gen. N. 1760.

Calyx bilabiate. *Filaments* ten, united into two equal bodies. *Legumes* composed of one-seeded joints.

1. S. *sensitiva. Ait. Kew.* iii. *p.* 499. *&c.* 512. *t.* 13. *Willd.* iii. 1161.

Biennial or triennial, diffuse. *Leaflets* from three to six paired, with the margins, the under side of the nerve, and the petioles ciliate. *Legumes* six-jointed, and folded within the calyx. III. 343

Hind. Oda-Breeni.

Beng. Nulla Kashina.

Pentagnana sensitiva. Gmel. ed. syst. ii. 1119.

A native of Bengal, where it is common on moist pasture land. Blossoms and ripens its seed during the cold season; cattle are fond of it. It is common in the Botanic garden, and makes excellent hay.

2. S. *aspera. Roxb.*

Annual, erect; *leaflets* from thirty to forty pair. *Legume* exsert, pedicelled. *Joints* from six to eight, rugged in the middle.

Beng. Kath Sola.

A native of Bengal, where it is found with the former species on low wet pasture land, borders of rice fields, &c. appearing with the rains in May and June, and perishing when they are over in October, and November.

Stem erect, from two to six feet high, fistulous. *Branches* short, spreading. *Bark* somewhat scabrous, with small coloured glands, &c. bristles scattered over all the tender parts of the plant. *Leaves* alternate, pinnate, from two to six inches long. *Leaflets* from twenty to fifty pair, linear, oblong, smooth, with reddish margins. *Stipules* adjoined, ovate, lanceolate, ciliate. *Racemes* axillary and terminal, flexuous, from two to six-flowered. *Flowers* rather remote, middle sized, yellowish. *Bractes* ovate, and ovate cordate, two pressing on the calyx laterally like a calycle, and one at the origin of each pedicel, their margins are serrate, coloured and ciliate. *Calyx* bilabiate. *Segments* oval, equal, and emarginate. *Corol, banner* round-oval, twice the length of the calyx. *Wings* oblong, long-clawed. *Keel* boat-shaped, two parted at the base. *Filaments* ten, united into two equal bodies. *Germ* pedicelled. *Style* ascending. *Stigma* simple, even with the anthers. *Legumes* pedicelled, linear, nearly straight, slightly crenate on the under margin, from six to ten jointed; *joints* nearly square, swelled, and scabrous at the middle. *Seed* reniform, pale brown. III. 344

Note. Until I observed this plant I was inclined to consider *Smithia sensitiva*, a species of *Hedysarum*, but on finding this agree as well in its natural and essential characters with Aiton's species, I have been induced to consider them as constituting a well marked genus, differing essentially in both calyx and stamens from *Aeschynomene*, and *Hedysarum*.

HEDYSARUM. Schreb. gen N. 1204.

Corol with keel transversely obtuse. *Loment* articulated with one seed in each.

Note. Those with a folded legume or rather loment of two or more roundish joints have [illegible] sufficient to authorize their being separated from this inconveniently over-grown genus. I have already six species which would form a pretty good foundation for the new family viz a new one with simple leaves, *lagopodioides*, &c. also, *alopecuroides* with ternate leaves, and with pinnate leaves *pictum*, and *Crinitum*.

Page Carey Ed.

SECT. I. *Leaves simple.*

1. H. *alhagi. Willd.* iii. 1171.

Shrubby, armed. *Leaves* oblong, mucronate. *Stipules* ensiform.

Sans. Yasa, or yavasa.

Hind. Juwasa.

Pers. Shooturk'has from its being the common food of the camel.

A native of Hindoostan, and generally found in a dry, rather barren, sandy soil. Its
III. branches are used for the screens, called Tattees, employed during the hot dry winds, com-
345 mon in many parts of Southern Asia. In the neighbourhood of Candahar and Mirut and the bank of the Chilchuk, manna is said to be procured from it. This substance exudes from the plant after spring rains and is gathered by merely shaking it off. See *Fothergill, p.* 257. In the Dooab, where it is common, it is for the most parts herbaceous and eaten down to the ground by cattle.

2. H. *moniliferum. Willd.* 1173.

Perennial, cespitose. *Leaves* round, cordate. *Heads* terminal. *Bractes* three-flowered. *Legume* necklace-shaped with round joints.

Hedysarum *moniliferum. Burm. Ind. t.* 52. *f.* 3. pretty good.

Teling. Amera.

Common on pasture land over most parts of India. Flowers in the rains and cold season.

3. H. *vaginale. Willd.* iii. 1176.

Perennial, cespitose. *Leaves* from oval to linear, oblong with cordate base, rather obtuse, smooth. *Racemes* leaf-opposed. *Bractes* three-fold, two-flowered. *Legume* sub-cylindric, from four to six-jointed.

Genista articulata, &c. *Burm. Zeyl. t.* 49. *f.* 1. pretty good.

Common on pasture land in most parts of India. Flowers in the rainy and cold seasons.

4. H. *procumbens. Roxb.*

Perennial, diffuse, hairy in every part. *Leaves* simple, roundish. *Racemes* leaf-opposed, flowers in pairs, remote. *Legumes* from two to four-jointed, both margins notched.

A small perennial ; a native of dry, sandy pasture lands, though by no means common.

III. *Stem* there is nothing that can be so called. *Bractes* many, diffuse, long, round, slender,
346 dichotomous, very hairy. *Leaves* alternate, short-petioled, oval, or orbicular with a small point, hairy. *Stipules* of the petioles embracing the branch, chaffy, half-lanceolate. *Racemes* leaf-opposed, lateral, all axillary, many times longer than the leaves, few-flowered. *Bractes* three-fold, chaffy, ciliate, two-flowered. *Flowers* remote, small, of a bluish purple. *Legumes* compressed, from two to four-jointed, hairy.

5. H. *gramineum. Willd.* iii. 1172.

Biennial, erect. *Leaves* simple, linear, smooth. *Racemes* terminal, long.

H. *gramineum. Retz. Obs.* v. *N.* 70.

Beng. Pan Nutta.

A small perennial woody species, growing generally amongst long grass on dry ground. It flowers during the wet and cold seasons.

Stem scarcely any. *Branches* many, sometimes nearly erect, sometimes diffuse, very slender, woody, from one to three feet long. *Leaves* alternate-petioled, linear-lanceolate, smooth, one and a half, or two inches long, and half an inch broad. *Stipules* of the petioles chaffy, semi-lanceolate. *Racemes* terminal, pretty long. *Bractes* three-fold, lanceolate, three-flowered. *Flowers* small, beautifully variegated with red and yellow. *Calyx* four-cleft ; *upper division* emarginate ; *apex* bearded. *Legumes* erect, sub-cylindric, composed of from three to five, almost round, pretty smooth articulations.

6. H. *bupleurifolium. Willd.* iii. 1171. *Corom. pl.* ii. *N.* 194.

Perennial, diffuse, hairy. *Leaves* linear-lanceolate. *Stipules* chaffy. *Spikes* imbricated with two-flowered bractes. *Calyces* four-leaved ; the upper one bidentate. *Legumes* erect, beaked, obliquely jointed.

Difference of soil and situation produces such great changes in this plant as to make a
III. transient examiner imagine he had met with two or more distinct species. In a good soil, and
347 shaded by large trees, it grows with an erect, woody stem, to be three or four feet high, with many long straggling branches, resting on the ground ; in an exposed poor soil, it is a small diffuse, seemingly annual. In all, the succulent parts are hairy. The flowering time the wet and cold seasons.

Leaves remote, alternate, horizontal, petioled, lanceolate, hairy, size various. *Petioles* three-sided. *Stipules* of the petioles chaffy, embracing much of the branch of the leaf, small and subulate. *Spikes* terminal, and leaf-opposed, many-flowered, imbricated with chaffy, hairy, ciliate, ovate, pointed, two-flowered bractes. *Flowers* of a bright red. *Calyx* four-leaved ; *upper leaf* emarginate, hairy, the length of the corol. *Legumes* erect, sharp pointed, of from three to five obliquely oval rugose joints.

7. H. *styracifolium. Willd.* iii. 1174.

Shrubby, erect, ramous, every part except the upper surface of the leaves hairy. *Leaves* oblong, emarginate. *Racemes* terminal. *Bractes* solitary, cordate, two-flowered. *Calyx* four-leaved, all entire. *Legumes* straight, thin, of five rugose joints, notched on both sides.

A native of Coromandel ; flowering time the close of the rains. Seed ripe in January.

8. H. *glumaceum. Willd.* iii. 1172.

Biennial, diffuse, hairy. *Leaves* lanceolate, clouded. *Racemes* terminal, becoming leaf-opposed. *Bractes* two-flowered. *Calyx* four-leaved, ciliate, the upper one bidentate. *Legume*

of from three to four oblique, rugose joints. Page Carey Ed.

A native of the coast of Coromandel; in the Botanic garden at Calcutta it blossoms in the rains, and cold season.

9. H. *triquetrum. Willd.* iii. 1176. III. 348

Perennial, diffuse. *Leaves* simple, oblong-cordate; *petioles* winged. *Racemes* terminal. *Legumes* smooth, many-jointed.

The figures of this plant, if intended for it, in the *Herbarium Amboinense, Burman's Flora Zeylanica,* and *Flora Indica,* are all bad. It is a native of many parts of India, though not common, so far as I have been able to observe, in any; flowering time the cold season.

Stems perennial, many, diffuse, with many bifarious, spreading, coloured, somewhat three-sided, smooth, branches. *Leaves* alternate, petioled, bifarious, ovate-oblong, smooth on both sides and entire. *Petioles* winged. *Stipules* as in the genus. *Racemes* terminal. *Flowers* numerous, three-fold, rose-coloured. *Legumes* of from four to eight joints, and notched on the under side.

10. H. *alatum. Roxb.* 1896.

Shrubby, erect, with many erect, from three to four-sided branches. *Leaves* simple, long, linear-cordate. *Petioles* winged. *Racemes* terminal. *Legumes* hairy, thin, from four to six-jointed; *lower margin* crenulate.

H. *triquetrum. Burm. Ind. t.* 25. *f.* 2.

A native of Hindoostan. Flowering time the close of the rains. Is allied to H. *triquetrum* on account of the winged petioles only; that is always procumbent, this straight and perfectly erect, and a much more beautiful plant.

Trunk short and straight. *Branches* many, erect, the tender shoots, three, or four-angled, from the insertion of the leaves downwards these angles are more villous than the other parts. *Leaves* simple, linear-cordate, entire, smooth on both sides, about four inches long. *Petioles* much shorter than the leaves, winged, which at the upper wing terminate in two recurved points. *Racemes* terminal, and from the exterior axills, erect, from six to twelve inches long. *Flowers* numerous, small, of a violet-colour. *Bractes* three-fold, two-flowered, but between these two flowers there is according to my observations a succession of abortive flowers. III. 349
Calyx four-cleft; the *upper division* broad, acute and entire. *Legume* broad, thin, hairy, from four to six-jointed, and crenulate on the lower edge.

11. H. *gangeticum. Willd.* iii. 1175.

Shrubby, oblique. *Leaves* ovate, acute, scabrous above, and villous underneath. *Racemes* terminal, very long and slender. *Flowers* paired. *Carina* and *wings* reflexed. *Legume* from five to six-jointed, straight on the upper margin.

Sans. Salpurnee.

Beng. Sal pan.

Of this we have two varieties; one with purple, the other with white flowers. They are natives of Coromandel, Bengal, and other parts of India, and in flower most part of the year. Seed ripens in the cold season.

12. H. *collinum. Roxb.* 393.

Shrubby, oblique. *Leaves* ovate-cordate, downy underneath. *Racemes* axillary, very long. *Legume* notched on the under side.

A shrubby species found chiefly amongst the Circar mountains, growing under the shade of trees.

Leaves alternate, petioled, cordate, or nearly round, entire, below downy, the longer ones are from five to six inches long, and from four to five broad. *Petioles* about an inch long, half round, downy. *Stipules* of the petioles cordate, acute; those of the leaves subulate. *Racemes* axillary, and terminal, two, three, or four times longer than the leaves, filiform, erect, hairy, bearing many small, bright violet-coloured flowers. *Legumes* erect, compressed, from four to six-jointed, pretty smooth.

Allied to H. *gangeticum,* and *latifolium;* from the former it differs in bearing axillary racemes and ovate cordate leaves. And from the latter in the leaves being pointed, not near so broad in proportion to their length, and not repand as in that species. III. 350

13. H. *latifolium. Roxb.*

Shrubby, oblique. *Leaf* simple, round reniform-cordate, somewhat repand. *Stipules* semi-cordate, cuspidate. *Racemes* axillary, clothed with hooked bristles; *legumes* from three to five-jointed, notched on the under margin.

A native of the northern parts of Hindoosthan. Colonel Hardwicke brought the seeds to the Botanic garden, where the plants blossom during the rains.

Stem short, ligneous, and pretty smooth. *Branches* oblique, almost horizontal, or reclinate, the slender parts villous. *Leaves* alternate, bifarious, short-petioled, roundish cordate, downy underneath, scabrous above, about three or four inches long, and nearly of the same breadth. *Stipules* of the petioles semi-cordate, and cuspidate; those of the leaves subulate. *Racemes* axillary, and terminal, horizontal, many times longer than the leaves, clothed with small hooked bristles. *Flowers* three-fold, the middle one last and they are small and of a bright purple colour. *Bractes* three-fold, triangular, acute. *Legumes* flat, clothed with hooked bristles, four or five-jointed, and more deeply notched on the under margin.

14. H. *strobiliferum. Willd.* iii. 1176.

Shrubby. *Leaves* simple, ovate. *Racemes* terminal, imbricated laterally with reniform folded inflated bractes inclosing the fasciculi of flowers.

An elegant pretty large shrub, a native of various parts of India. Flowering time the cold season.

Page Carey Ed. III. 351

Root ramous. *Trunk* short, woody, covered with smooth, ash-coloured bark. *Branches* numerous, with their extremities waving, and when in blossom drooping. *Leaves* simple, alternate, bifarious, short-petioled, ovate, acute, acuminate, entire, with numerous, large, and parallel veins, smooth on both sides, various in size, the larger ones from three to six inches long, and about half as much in breadth. *Stipules* small, caducous. *Racemes* terminal, drooping, imbricated on the two sides with alternate, bifarious, reniform, when forcibly expanded, for in their natural folded state the shape is semi-reniform, folded, inflated, nervous, scarious, large bractes; each concealing in its duplicature a small fascicle, or more, of peduncled, pure white, middle-sized flowers. *Legume* of one joint with one or two small reniform maculated seeds.

15. H. *bracteatum. Roxb.*

Shrubby, erect; *leaves* narrow-cordate. *Racemes* terminal, compound, bifariously imbricated with alternate, reniform, inflated, downy bractes. *Legume* of one oval joint, two-seeded.

A native of the interior parts of Bengal; from Dinajpoor Dr. W. Carey sent the seeds to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and begin to blossom during the cold season.

Stems several, shrubby, erect, a few branches from their upper parts. *Tender parts* somewhat angular and soft, with very fine down, height of the four-year-old plants about three or four feet. *Leaves* bifarious, alternate, very short petioled, narrow-cordate, entire, smooth above, about three inches long, by one, and one and a half broad. *Stipules* chaffy, ensiform, permanent. *Racemes* terminal, or from the exterior axills, drooping, compound, or even decompound. *Ramifications* thereof bifarious, alternate, very downy. *Bractes* folded, &c. as in H. *strobiliferum*, but in this species they are soft with much down. *Exterior bractes* ensiform, ciliate, and placed like stipulæ one on each side of the insertion of the large folded bractes. *Flowers* minute; *racemes* within and hid by the folded bractes except for a few hours when in vigorous blossom the bractes open a little, they are small, rose-coloured. *Legumes* small, hid within the scariose bractes, of one oval joint, villous, one or two-seeded, two is most common.

III. 352

16. H. *gyrans. Willd.* iii. 1186.

Suffruticose, erect, twiggy. *Leaflets* lanceolate, the lateral minute, one or both often wanting. *Racemes* terminal and axillary. *Legume* hispid, six-jointed.

Beng. Gora-chand.

A native of Bengal. Flowering time the cold season.

Root ramous. *Stem* erect, with a few twiggy, smooth branches; the whole height from three to four feet. *Leaves* alternate, simple and ternate. *Leaflets* lanceolate, obtuse at both ends, smooth and entire, the exterior one much larger; the lateral ones are sometimes wanting. *Petioles* half-round, with a few hairs over them. *Stipules* tapering to a fine point. *Racemes* terminal and axillary, hispid. *Bractes* cordate, concave, two-flowered. *Flowers* pretty large, of a pale yellow, with a little blue in the wings. *Calyx* membranaceous five-toothed. *Filaments* alternately short and broad, longer and filiform. *Anthers* roundish. *Stigma* two-parted. *Legume* crenulate on the upper margin, very hispid, from six to eight-jointed.

The wonderful rotatory motion of the small lateral leaflets of this plant, has already been taken notice of in various publications: it is unnecessary to repeat, what is now well known.

17. H. *vispertilionis. Willd.* iii. 1177.

Annual and biennial, straight. *Leaves* ternate, and simple, highly coloured; lateral leaflets sub-triangular, exterior, large and transversely crescent-shaped, terminal. *Legumes* from four to six-jointed; folded up in the inflated calyx.

Beng. Chamchicka.

An uncommon looking, pretty plant, a native of various parts of India, in flower and seed the whole year.

18. H. *sororium. Willd.* iii. 1170.

Herbaceous, procumbent, smooth, three-sided. *Leaves* sub-simple, orbicular, emarginate smooth. *Racemes* axillary.

Legumes semi-oval, one-seeded.

III. 353

Teling. Nalla-sora-cada.

A native of naked sandy pasture ground. Flowers during the wet and cold seasons.

Root simple, long, slender, biennial or triennial. *Stem* none. *Branches* numerous, simple, spreading close over the ground to a great extent, somewhat from eight to ten feet each way, slender, smooth, three-sided. *Leaves* remote, alternate, petioled, orbicular, emarginate, smooth, often clouded, those near the root simple, further they have often a minute, lanceolate leaflet or two, (called bractes in the *Mantissa,)* as in H. *gyrans. Stipules* of the petioles semi-lanceolate, chaffy; those of the leaves, or leaflets minute. *Racemes* axillary, longer than the leaves, few-flowered. *Bractes* concave, few-flowered. *Legumes* boat-shaped, pointed, smooth, always one-jointed and one-seeded.

SECT. II. *Leaves conjugate.*

19. H. *diphyllum. Willd.* iii. 1178.

Herbaceous, cespitose. *Leaves* binate; *leaflets* lanceolate. *Stipules* lanceolar.

Nelam mari. *Rheed. Mal.* ix. *t.* 82.

The leaflets in Burman's figure are much too broad and short for the sort on the conti-

nent of India, and I think Willdenow must be right in considering it a distinct species. Our plant is common on poor sandy pasture land, in many parts of India. Page Carey Ed.

SECT. III. *Leaves ternate.*

20. H. *triflorum. Willd.* iii. 1202.

Perennial, creeping. *Leaves* ternate. *Leaflets* obcordate. *Flowers* peduncled, from three to six, opposite to the leaves. *Legumes* falcate, from four to five-jointed, notched on the under side.

Beng. Kodalia.

H. *trifoliatum* repens, &c. *Burm. Zeyl.* vi. 54. *f.* 2.

Teling. Moonoodda-Mondoo. III. 354

Very common on pasture ground and helps to form the most beautiful turf we have in India.

Root woody, perennial. *Stem* and *branches* creeping, alternate, bifarious, slender, a little hairy, in some soils very much so. *Leaves* ternate. *Leaflets* obcordate, small. *Stipules* cordate, and partly attached to the petiole. *Flowers* leaf-opposed, from three to six peduncled, of a beautiful bright blue. *Style* swelled at the angle. *Legumes* from three to six-jointed, curved a little, the seed-bearing margin straight, the other notched. Cattle are very fond of it.

It is probable that Burman's plant, also his H. *Stipulaceum. Burm. Flor. Ind. p.* 168. *t.* 54. *f.* 2. and this plant are the same, for in this species there are besides these stipules of the petioles, others within at the base of the branchlets, but the peduncles being numerous, and opposite to the leaves, is a strong specific difference.

The natives apply the fresh plant bruised to wounds that do not heal well.

21. H. *reptans. Roxb.*

Perennial, cespitose, hairy. *Leaflets* oval. *Peduncles* leaf-opposed, three or four-flowered. *Legume* from four to six-jointed.

Hedysarum trifoliatum. *Burm. Zeyl.* 118. *t.* 54 *f.* 1.

This figure has already been quoted by various authors for a variety of *Hedysarum triflorum*, while the shape of the leaves, and the solitary, often more than one-flowered, peduncles in this plant clearly evince their being distinct species, besides this is a much more robust plant than *triflorum*. My plant is a native of the interior parts of Bengal, and from thence was introduced into the Botanic garden at Calcutta by Dr. W. Carey; flowering time the rainy season.

Root perennial. *Stem* scarcely any thing that can be so called but many perennial branches creeping, even to their very apices, perfectly flat on the earth and striking root at the joints. *Branchlets* alternate, all slender, and very hairy, the largest from one to two feet long. *Leaves* petioled, ternate. *Leaflets* oval, entire, pretty smooth, and of a paler green in the centre. *Peduncle* solitary, opposite to the leaves and about their length, each supporting three, four, or five small white flowers on long slender pedicels. *Legume* of from three to six joints. III. 355

22. H. *quinquangulatum. Roxb.*

Herbaceous, diffuse, five-sided, hispid. *Leaves* ternate; *leaflets* oval, downy. *Stipules* cordate. *Racemes* numerous. *Flowers* paired. *Legumes* hispid, six-jointed, notched on both margins.

Compare with H. *diffusum. Willd.* iii. 1180.

This is a large, luxuriant, diffuse, perennial species, a native of strong rich moist pasture lands, such as the borders of rice fields. Flowering time the wet and cold seasons.

Root woody, ramous. *Stem* no other than many ramous, hispid, five-sided, diffuse branches, two, three, or four feet long. *Leaves* ternate, petioled, nearly bifarious. *Leaflets* oval, emarginate or obtuse, downy, about one inch and a half long and one broad. *Petioles* as long as the leaflets, channelled. *Stipules* of the petioles cordate, acute; those of the leaflets lanceolate, large. *Racemes* terminal, and axillary, frequently compound. *Bractes* three-fold, two-flowered. *Flowers* numerous, small, blue. *Legumes* compressed, from five to seven-jointed, covered on both margins with hispid, hooked hairs, which make them adhere to every thing that touches them.

Cattle eat this species greedily and as it grows quickly, and with luxuriance, it might be cultivated to advantage.

23. H. *articulatum. Roxb.*

Annual, creeping; *branches* five-sided. *Leaves* ternate; *leaflets* ovate. *Stipules* ear-shaped, stem-clasping. *Racemes* terminal and axillary, harsh with hooked hairs, often compound. *Legume* from four to five-jointed. III. 356

A native of the interior parts of Bengal. The flowering time the close of the rains; the seeds ripen during the cold season, soon after which the whole plant perishes.

Stem none, but several, stout, sub-ligneous branches from three to six feet long spreading close on the ground, and striking root. *Branchlets* alternate, bifarious, five-sided, villous, scabrous with small hooked hairs. *Leaves* alternate, bifarious, ternate. *Leaflets* ovate, obtuse, villous, and somewhat scabrous on both sides; from one to three inches long, and broad in proportion. *Stipules* of the petioles ear-shaped, stem-clasping; those of the leaflets lanceolate, acute. *Racemes* axillary and terminal, very often compound and so form large, diffuse panicles. *Peduncles* and *pedicels* angular, and armed with harsh hooked hairs. *Bractes* of the ramifications like the stipules of the flowers, or extreme divisions, ovate, ciliate, two or three-flowered. *Flowers* minute, very numerous, slender, pedicelled, pink coloured. *Legumes*

Page Carey Ed. linear, a little curved, from four to six-jointed, notched on the under side, armed with a few hooked hairs, which makes them adhere readily to anything that touches them.

Cattle are fond of the green plant, and as it is one of the most luxuriant of the genus, I have met with, it might be advantageously cultivated for fodder in India.

It comes very near my *Hedysarum quinquangulatum*, No. 398 ; but differs specifically in the stipules and shape of the leaflets, independent of their duration.

24. H. *vescidum. Burm. Ind.* 167. *&c. B. H.*

Perennial, creeping, hairy. *Leaflets* roundish, downy. *Stipules* subulate. *Racemes* terminal. *Flowers* three-fold. *Legumes* from four to five-jointed, notched on the underside, and covered with hooked hairs.

A creeping, perennial species, growing under the cover of bushes, in a dry, gravelly soil.
III. It flowers during the wet and cold seasons.
357 *Root* woody. *Stems* or rather *branches* several, prostrate, rooting at the joints, slender, two feet long; *young parts* covered with short hairs. *Leaves* alternate; *exterior leaflets*, rhombiform, from one to two inches each way, the pair smaller, obliquely obovate, all are entire and downy, particularly on the under side. *Stipules* awled, withering. *Racemes* terminal, with generally a smaller one from the exterior axill, long, erect, hairy. *Bractes* three-fold, three-flowered. *Flowers* small, of a deep purple, the middle one of the three is generally abortive. *Calyx* four-parted. *Legumes* compressed, obliquely truncate with a bristle, from three to four-jointed, notched on the under side, closely covered with many stiff, hooked hairs, which makes them adhere to every thing that touches them.

25. B. *diffusum. Roxb.*

Shrubby, diffuse. *Leaflets* oblong, ventricose. *Racemes* terminal, long, and slender, with rather remote fascicles of flowers. *Legumes* linear, from five to six-jointed, armed with hooked bristles.

A native of the interior parts of Bengal, and from thence introduced into the Company's Botanic garden by Dr. W. Carey. Flowering time the latter part of the rainy season.

Stems and *branches* diffuse, ligneous, but slender and variously bent. *Bark* smooth, of dark brownish green; *young shoots* covered with a few depressed harsh hairs; the length of the longer branches many feet. *Leaves* alternate, generally ternate, though sometimes simple; when so, they are cordate; when turned the leaflets are elliptic, or ovate-oblong, all are entire and pretty smooth on both sides. *Stipules* of the petioles taper, triangular; those of the leaflets ensiform. *Racemes* terminal towards the base, ramous, long, slender and villous. *Flowers* numerous, small, of a bright blue colour, collected in rather remote fasciculi, and blossoming
III. in succession. *Bractes* ensiform, one at the base of each pedicel. *Legumes* linear, from five to
358 six-jointed, covered with many short, hooked bristles by which they adhere readily and firmly to every thing that touches them.

26. H. *recurvatum. Roxb.*

Shrubby with recurved branches. *Leaves* bifarious. *Leaflets* ovate. *Racemes* axillary and terminal, drooping long before the flowers expand. *Bractes* many-flowered. *Legumes* linear, compressed, ramous, bristly, from six to seven-jointed.

A native of the interior parts of India, and introduced into the Botanic garden by Captain Hardwicke from Cawnpore. It flowers during the rains, and ripens its seed in the cool season.

Trunk (in our young plant) short but ligneous, with the branches bending to one side and their extremities recurved, the under parts clothed with short depressed hairs. *Leaves* bifarious, ternate. *Leaflets* ovate and oval, entire, rather acute, somewhat pubescent. *Petioles* channelled. *Stipules* of the petioles chaffy, taper-pointed, large; those of the leaflets subulate. *Racemes* axillary and terminal, before the flowers expand they point directly to the earth, afterwards they become very long, from one to two feet. *Bractes*, the exterior one single, broad-lanceolate, embracing several smaller with a succession of small violet-coloured flowers. *Calyx* four-cleft; the *upper division* broader but entire. *Banner* nearly white. *Wings* and *apex* of the keel blue. *Legumes* long, slender, compressed, clothed with hamous bristles by which they readily adhere to any thing they touch, both margins nearly even. *Joints* long, six or eight.

27. H. *purpureum. Roxb.*

Perennial, diffuse; *leaflets* oval, clouded. *Racemes* terminal, before expansion strobili-
III. form. *Legumes* six-seeded, notched on the under side.
359 Reared from seeds received from Dr. Carey, who gathered them on the northern frontier of Bengal. Flowering time the rainy season.

Stem short, nearly straight, with numerous longer branches from its base, spreading close on the ground and striking root at the joints; all are round and while young covered with short depressed white hairs. *Leaves* ternate. *Leaflets* exactly oval, entire, pretty smooth, of a darker colour on the upper surface, and often stained. *Petioles* channelled. *Stipules* of the petioles, from broad bases, tapering to a long daggered point; those of the leaflets awled. *Racemes* terminal, solitary, hairy, before the flowers expand, imbricated with numerous, two-flowered, broad based, dagger-pointed, ciliate bractes. *Flowers* large, very numerous, of a beautiful deep bright blue purple. *Calyx* smooth, four-parted; the *upper division* two-toothed. *Corol*, keel with two horns, not unlike those of *Indigofera*. However the general habit of the plant, besides the articulated legume, clearly points it out as a *hedysarum*. *Legume* of five or six orbicular joints, straight on the upper edge, and notched on the lower, hairy, particularly the margins.

28. H. *biarticulatum. Willd.* iii. 1183.

Shrubby, slender. *Leaves* ternate; *leaflets* oblong, smooth; *racemes* terminal. *Legumes* with one or two joints. Page Carey Ed.

H. *triphyllum. Burm. Zeyl. t.* 5. *f.* 2.

Teling. Nilla Kavani.

A small diffuse perennial or shrubby species, a native of dry sandy ground. Flowering time the wet and cold seasons.

Root woody, simple, descending to a great depth. *Stem* very trifling, and soon dividing into many ramous, diffuse, slender, smooth, purple branches. *Leaves* alternate, ternate. *Leaflets* nearly equal, oblong, smooth, about half an inch long and a quarter broad. *Stipules* of the petioles chaffy, embracing the branchlets, apices torn. *Racemes* terminal, many-flowered. *Bractes* three-fold, many-flowered. *Flowers* small, of a beautiful bright red. *Legumes* from one to two-jointed. *Joints* compressed, orbicular. III. 360

29. H. *umbellatum. Willd.* iii. 1182.

Sub-arboreous. *Leaflets* oblong, smooth, umbelled. *Legumes* from four to six-jointed, notched on one side.

H. *trifolium arboreum. Burm. Zeyl. t.* 51.

Teling. Chetenta.

A native of moist rocky valleys, where it grows to be a small tree, with smooth, green bark. It flowers during the hot season.

Branchlets twiggy, flexuose, somewhat three-sided. *Young shoots* a little downy. *Leaves* alternate, petioled, spreading, ternate. *Leaflets* oblong, pointed, smooth, entire, from two to three inches long, and one or one and a half broad. *Stipules* of the petioles short, cordate, chaffy; those of the leaflets subulate. *Umbels* simple, axillary, peduncled, globular, erect. *Peduncles* one-third the length of the petioles. *Legumes* from three to six-jointed, compressed, pretty smooth, a little recurved, notched on the upper margin.

30. H. *Cephalotes. R.*

Sub-arboreous, all the tender parts woolly. *Leaflets* oblong, ventricose, marked with many woolly, simple, parallel veins underneath. *Flowers* crowded on short-peduncled, axillary heads. *Legumes* flat, villous, incurved, from two to three-jointed.

A native of the interior parts of Bengal, and from thence introduced by Dr. W. Carey into the Botanic garden where it is in blossom most part of the year; the seed ripens during the cold season.

Stem ligneous, erect, often as thick as a man's leg. *Branches* spreading, with numerous, alternate, bifarious, three-sided, downy branchlets. *Leaves* alternate, bifarious, ternate. *Leaflets* elliptic, while young clothed with much, very soft, woolly hair, with numerous, parallel, woolly veins underneath, and the margins entire and woolly, from two to four inches long, and from one to two broad. *Petioles* deeply channelled and woolly, from one to two inches long. *Stipules* of the petioles ensiform, woolly on the outside, caducous, those of the leaflets filiform and also woolly. *Peduncles* axillary, generally solitary, woolly, scarcely one-third or one-fourth the length of the petioles, crowned with a simple, small head of small short-pedicelled white flowers. *Bractes* of the peduncles two at the base of the pedicels, solitary, one flowered, those of the flowers opposite, pressing on the calyx laterally, all are clothed with soft woolly hairs and are like the stipules, though much smaller. *Calyx* woolly on the outside, four-cleft; the *upper segment* broad. *Legumes* flat, incurved, villous, two or three-jointed. III. 361

31. H. *arboreum. R.*

Arboreous. *Leaflets* nearly round and smooth, with simple and parallel veins. *Stipules* solitary, spathiform, bidentate. *Heads* axillary, short-peduncled. *Legume* of one or two long, curved, fleshy joints.

A native of the Moluccas.

32. H. *pulchellum. Willd.* iii. 1179.

Shrubby, erect. *Leaflets* ovate-oblong. *Racemes* axillary and terminal, much longer than the leaves. *Bractes* paired, sub-orbicular, many-flowered, *Legumes* two-jointed.

H. *triplicatum* frutescens, &c. *Burm. Zeyl. t.* 52. good.

Beng. Juta Salpani.

A most elegant shrubby species, common in many parts of India, particularly the mountains; flowering time the rainy season.

Stem erect; *branches* spreading to one side with bifarious alternate branchlets, the bark of a dark rust colour. *Leaves* alternate, bifarious, alternate-ternate, expanding, short-petioled. *Leaflets* ovate-oblong, lineate; smooth above, a little hairy underneath. *Stipules* daggered, with long bristly points. *Racemes* axillary and terminal, of various lengths, the largest from two to three times longer than the leaves, with extremities drooping. *Bractes* alternate, bifarious, approximate, short-petioled, paired, sub-orbicular, with petioles ending in a long terminal bristle between them. *Flowers* crowded, expanding in succession, small, of a pale cream colour, and yellowish with age. *Calyx, upper lip* entire, the under one of an equal division. *Legumes* two-jointed, and completely hidden by the bractes. III. 362

33. H. *patens. Roxb.*

Perennial, diffuse. *Leaflets* oblong. *Racemes* terminal. *Bractes* three-fold, one-flowered. *Legume* from five to six-jointed, notched underneath, hamose, bristled.

A native of the Moluccas. In the Botanic garden at Calcutta it blossoms most part of the year.

Stem none, but several branches springing from the crown of a ligneous root, spreading over the ground to the distance of some feet, round, ligneous, villous, and coloured. *Leaves* alternate, bifarious, ternate, rarely single, and then near the root only. *Leaflets*, the pair

Page Carey Ed. smaller, ovate, and ovate-oblong, the terminal one nearly elliptic, or oval, all are obtuse, and pretty smooth, from one to two inches long. *Petioles* villous, shorter than the leaves, and channelled. *Stipules* of the petioles stem-clasping, chaffy, acute; those of the leaflets subulate. *Racemes* terminal, solitary, simple, few-flowered. *Bractes* three-fold, one-flowered; the lateral pair very small. *Flowers* small, purple. *Calyx* four-cleft; upper division broader, and bidentate. *Legumes* five or six-jointed, clothed with numerous hooked bristles; the *under margin* deeply notched.

34. H. *Junceum. Willd.* iii. *p.* 1194.

Herbaceous; *twigs* long, and straight; *leaflets* cuneate. *Flowers* axillary. *Legume* one
III. or two-seeded, the length of the segments of the calyx.
363 A native of Nepal, from thence Dr. Buchanan sent the seeds to the Botanic garden, under the name *Anthyllis cuneata*, where the plants grow freely, and blossom during the rains and cold season.

Root perennial. *Stem* erect, short, as they soon divide into long, simple, straight, or drooping, slender, villous twigs; they are all herbaceous. *Leaves* ternate while the plants are young, tending to be torn and often perfectly so; *leaflets* cuneate, villous, scarcely half an inch long, and less than a quarter of an inch in breadth. *Petioles* three-sided, villous. *Stipules* chaffy, ensiform, petiolar. *Peduncles* axillary, very short, few-flowered. *Flowers* small, of a pale yellow. *Bractes* minute, some embracing the insertions of the pedicels, and two large ones the calyx. *Calyx* four-cleft; *division* slender and acute, the upper one broader and two-toothed. *Banner* roundish, with a two-lobed, purple spot in the middle. *Stamina* one and nine. *Legume* scarce the length of the calyx, oval, one or two-seeded.

35. H. *tuberosum. Willd.* iii. 1197.

Shrubby, twining; *leaflets* downy. *Racemes* long; *flowers* three-fold. *Legume* hairy, pendulous, four-jointed; contracted at the joints.

Kadsumi. *Banks' Icon. Kæmpf. tab.* 25.

Teling. Daree, Goomodee.

A rare species, a native of the valleys far up amongst the mountains. It flowers during the hot season, at which time it is perfectly naked of leaves, being deciduous about the beginning of the cold season.

Root tuberous, very large. I think one of the largest I ever saw. *Stems* twining, woody, running over high trees, &c. *Leaves* alternate, petioled, ternate. *Leaflets* roundish, pointed, entire, downy, from six to twelve inches each way. *Petioles* channelled, from six to twelve
III. inches long. *Stipules* of the petioles cordate, those of the leaflets subulate. *Racemes* simple or
364 branchy, as long as the leaves, from tuberosities caused by the cicatrices of the old leaves, erect, round, smooth. *Flowers* numerous, three-fold, pretty large, blue. *Legumes* from two to six-jointed, pendulous, compressed, pointed, much contracted at the joints, very hairy.

The root peeled and bruised into a cataplasm is employed by the natives of the mountains where it grows to reduce swellings of the joints.

SECT. IV. *Leaves pinnate.*

36. H. *sennoides. Willd.* iii. 1207.

Shrubby. *Leaves* pinnate; *leaflets* alternate, from four to six-paired, obovate. *Peduncles* axillary, nodding, few-flowered. *Legumes* pendulous. *Joints* from three to four, echinate.

Teling. Nall Kashina.

Russelia of König.

A pretty large ramous shrub, a native of forests, hedges, uncultivated lands, &c. It flowers during the rains.

Stem woody, short, irregular. *Bark* dark-coloured. *Branches* numerous, irregular; *young shoots*, *petioles*, *peduncles*, *pedicels* and *calyx*, covered with a soft kind of glutinous hair, the gluten is of a bright gold colour, and is frequently seen in small, beautiful, distinct, globules at the extremities of the hairs. *Leaves* alternate, pinnate, with an odd one, about two inches long. *Leaflets* alternate, from four to six pair, obovate, a little pointed, smooth, entire. *Stipules* of the petioles chaffy. *Racemes* axillary, short, bowing, from three to six-flowered. *Flowers* pretty large, yellow, bowing. *Legumes* pendulous, compressed, from two to five-jointed, much contracted at the joints, muricate, glutinous.

Dr. König made a new genus of this and called it after Dr. Patrick Russell, without
III. knowing that another genus has been named after his brother the late Dr. A. Russell.
365 37. H. *lagenarium. R.*

Perennial, floating, spongy, leaflets numerous. *Stipules* lanceolar, adjoined. *Peduncles* about two-flowered, joints of the legume from four to six, scabrous in the middle.

Aeschynomene lagenaria. *Lour. Cochin Ch.* 446.

Aeschynomene *aspera. Willd.* iii. 1163.

Hind. and *Beng.* Shola and Phool shola.

Teling. Neerjeelooza.

Common on the borders of the lakes of sweet water in most parts of India. Flowering time the rainy and cool seasons. The larger plants are particularly light, white and spongy; they are gathered during the dry months of April and May, and converted by the natives of Bengal into a great variety of toys, floats for fishing nets, gentlemen's hats, &c.

38. H. *Neli-tali. R.*

Herbaceous, diffuse and scabrous. *Leaflets* numerous, minute. *Stipules* lanceolar, adjoined. *Legumes* from six to ten-jointed, smooth on both sides.

Neli-tali. *Rheed. Mal.* ix. *t.* 18. Page Carey Ed.
Teling. Tiga jeelooga.
Aeschynomene *Indica. Willd.* iii. *p.* 1164.
Found on moist pasture ground, during the rainy season.

*DOODIA. R.**

Calyx bilabiate; *upper lip* bifid; *under* tripartite, in the mature state resupine, by the incurvation of the upper end of the pedicel. *Loment* moniliform, composed of from two to six sub-globular, one-seeded joints, slenderly connected and compactly folded up within the subulate hairy segments of the calyx. III.

The plants which fall under the above character have the general habit of *Hedysarum*, viz. perennial, for the most part shrubby, their tender parts armed with diverging harsh hooked bristles. 366

Leaves simple, ternate or equally pinnate and stipulate. *Racemes* terminal, before expansion imbricated with two-flowered dagger-pointed bractes. *Flowers* of a middling size, and rosy, pedicels pretty long, and what is a strong characteristic mark of the genus they become rigidly incurved soon after the flowers decay, pressing the folded loments forcibly in against the rachis. *Corol* as in the generality of papilionaceous plants. *Filaments* single and nine-cleft. *Anthers* equal, oval. *Germ* sub-moniliform. *Style* clavate. *Stigma* capitate. *Loments* composed of from two to six roundish, one-seeded joints, united by slender isthmuses which admit of their being very perfectly folded up within the segments of the calyx. *Embryo* curved, furnished with a thin perisperm.

1. D. *simplicifolia. R.*

Shrubby. *Leaves* simple, ovate, oblong, lineate, villous underneath, scabrous above. *Racemes* terminal, panicled. *Loments* of several joints.

A native of Chittagong where it flowers in October and November.

2. D. *lagopodioides. R.*

Perennial, prostrate. *Leaves* ternate, and single. *Racemes* oblong, dense. *Legumes* two-jointed.

Beng. Goluk-chakuli.

A native of the coast of Coromandel as well as of Bengal; flowering in the rainy season.

Stems several, slender, perennial, prostrate, and rooting at the joints, round, covered with short scabrous hairs. *Leaves* alternate, ternate, and simple. *leaflets* roundish, emarginate, both sides covered with short scabrous hairs; the largest about two inches each way. *Stipules* subulate, those of the petiole having a broad base. *Racemes* solitary, terminal, peduncled; at first conical, afterwards cylindric, very hairy. *Bractes* oblong, acute, concave, hairy. *Pedicels* uniting at the base, and one very hairy, after flowering time incurved. *Flowers* numerous, rose-coloured. *Calyx* very hairy, the lower three divisions very long, and still more hairy. The *legumes* generally consist of two, oval, smooth joints folded together, connected by a slender isthmus, and bent in against the rachis, by the incurvature of the pedicel, after the flowers decay. III. 367

3. D. *hamosa. R.*

Shrubby, diffuse. *Leaves* simple, and ternate, sub-rotund, villous. *Racemes* axillary and terminal, before expansion strobiliform. *Legumes* from two to four-jointed.

A native of the interior parts of Bengal. Flowering time, the end of the rains.

Stem scarcely any, but numerous, diffuse, variously bent, straggling, or creeping, woody branches; *young shoots* and *racemes* armed with shorter hooked bristles, intermixed with longer straight hairs. *Leaves* from simple to ternate. *Leaflets* from round to obcordate, emarginate, downy underneath, from one to two inches long. *Stipules* of the petioles taper, long, and subulate from a broad, semi-cordate base; those of the leaflets filiform, all are hairy. *Racemes* axillary and terminal, before the flowers appear strobiliform, but stretching out a great length by the time the seed is ripe. *Bractes* alternate, two-flowered, ovate, concave, with a long subulate point, ciliate, and hairy, one-flowered, after the flowers decay they become rigidly incurved, pressing the legume against the rachis of the racemes, making what was the under division of the calyx the upper. *Flowers* numerous, pretty large, of a pale rose-colour, in the morning changing to lilac. *Calyx* very hairy. *Legume* of two, three, or four round joints, united by slender pedicels. III. 368

Excepting the racemes and size of the plant, this species is very much like *lagopodioides* and if I had not both growing before me at the same time, it might be difficult to find out wherein they differ specifically. The lengthening raceme is one of the most conspicuous marks.

4. D. *alopecuroides. Roxb.*

Perennial, diffuse, the tender parts clothed with small hooked bristles. *Leaves* ternate; *leaflets* oval, obtuse. *Racemes* imbricated, and resembling a fox's tail from the hairiness of the calyx, bractes, and incurved pedicels, which bend the two-jointed legumes in against the rachis; the *upper lip* of the calyx minute, and two-toothed.

A native of the northern parts of India, from thence Colonel Hardwicke sent the plant to the Botanic garden where it grows freely, and blossoms during the rains.

Stem none, but several, spreading, perennial, branches with ascending extremities, clothed with short, hooked bristles. *Leaves* scattered, petioled, ternate; *leaflets* ovate, obtuse, entire, clouded, both sides clothed with the same short hooked bristles; from two to four inches long,

* In memory of Dr. Samuel Doody, an eminent Botanist, the friend and correspondent of Ray, Plukenet, and Sloane.

Page Carey Ed. and rather more than half of that in breadth. *Petioles* channelled, harsh, with hooked bristles. *Stipules* ending in a long, subulate hairy point from a broader, ciliate base. *Racemes* terminal, imbricated before the flowers expand, strobiliform, ever after cylindric and more like a fox's tail than those of any other species I have yet seen. *Bractes* approximate, round-cordate, cuspidate, ciliate, two-flowered. *Pedicels* one-flowered, hairy, after the flowers droop, incurved. *Flowers* numerous, rose-coloured. *Calyx* bilabiate. The lower three divisions long, filiform, and very hairy; the upper two very short. *Legume* two-jointed, folded together in the bottom of the calyx.

III. 369 5. D. *picta. R.*

Shrubby, erect. *Leaves* simple and pinnate; *leaflets* linear. *Racemes* terminal, lengthening, flowers paired. *Loments* from three to five-jointed.

Hedysarum pictum. *Willd.* iii. 1204.

Hind. Dabra.

Beng. Sunkur-juta.

A native of the shady banks of water courses, &c. Flowers during the rains.

Stem erect, shrubby, branchy, from three to four feet high. *Leaves* alternate, petioled, from simple to pinnate. *Leaflets* the lower or single are generally oblong-ovate, two to three inches long, and one and a half broad, the leaflets of the compound leaves are linear-lanceolate, all are obtuse, entire, and beautifully clouded on the upper surface with dark brownish purple, below a little reticulated and downy. *Racemes* terminal, erect, rigid, cylindric, hairy. *Bractes* of the peduncles chaffy, permanent; those of the flowers lanceolate, two-flowered, falling. *Flowers* numerous, small, red. *Pedicels* incurved after the flowering time. *Calyx*, apices of the divisions incurved and bearded. *Legume* consisting of from three to six oval joints, connected by a slender isthmus, the incurved form of the pedicels presses them so much against the rachis, that the form is with difficulty observed, till forcibly extended.

6. D. *crinita. R.*

Shrubby, diffuse, densely clothed with short hamose bristles. *Leaves* pinnate; *leaflets* five, linear-oblong. *Racemes* terminal. *Bractes* lanceolate, ciliate, two-flowered. *Pedicels* and *calyces* most hairy. *Legume* three or four-jointed, and pressed together against the rachis.

Hedysarum crinitum. *Willd.* iii. 1218. *Lour. Cochin Ch.* 451. *Fl. Ind. t.* 56.

A native of Chittagong, differing from *picta* in being a lower, and more diffuse plant,

III. 370 with broader leaves, never variegated, and the bractes and calyx much more hairy.

Stem trifling, but several, spreading, or leaning branches, the lower resting on the ground; *tender shoots* round and armed with innumerable hamose bristles. *Leaves* unequally pinnate, horizontal. *Leaflets* two pair with a terminal one, linear-oblong, entire, of a firm texture, rather lucid above, and reticulated underneath; about three inches long. *Petioles* round, and armed like the other tender parts. *Stipules* scariose, broad-based, long taper-pointed, caducous; those of the leaflets similar, but smaller. *Racemes* terminal, sessile, often several together, their base imbricated with many, broad-based, tapering, ciliate, permanent bractes. *Bractes* of the raceme solitary, lanceolate, two-flowered, caducous. *Pedicels* longer than the flowers, very hairy, becoming incurved when the corol drops. *Flowers* numerous, rose-coloured, pretty large. *Calyx* five-cleft; *division* subulate, the upper two when in blossom, for in seed they become the undermost, rather small, all are very hairy.

INDIGOFERA. Schreb. gen. N. 1205.

Corol with an awl-shaped spreading spur on each side of the keel.

1. I. *linifolia. Willd.* iii. 1220. *Corom. pl.* ii. *N.* 196.

Perennial, cespitose. *Leaves* simple. *Legumes* globular, seeded.

Hedysarum *linifolium. Linn. Suppl.* 331.

Beng. Bhangra.

Common amongst grass all over India; it is probably the smallest of the genus. In Bengal there are two varieties; one with red, the other white flowers.

2. I. *echinata. Willd.* ii. 1222.

Stems prostrate. *Leaves* simple, obovate, dotted. *Racemes* axillary. *Legumes* crescent-shaped, with hooked bristles on the convex side, one-seeded.

III. 371 Hedysarum *rotundifolium. Vahl. Symb.* ii. *p.* 81.

Teling. Nalla-paleroo.

Onobrychis minor monophyllus madraspatana. *Pluk. Alm.* 160. *t.* 433. *Fig.* 1.

Hedysarum *numularifolium. B. H.*

A native of moist borders of rice fields. It flowers during the wet season.

Root perennial, ramous. *Stem* no other than many ramous, prostrate, angular, smooth, coloured, from one to three feet long branches, sometimes striking root. *Leaves* simple, alternate, bifarious, sub-sessile, orbicular, or broad-oval, a very little hairy, marked with many, small, glandular pits. *Stipules* subulate. *Racemes* axillary, short-peduncled, about as long as the leaves, from six to eight-flowered. *Flowers* small, red. *Keel* pointed, daggers obtuse. *Legumes* horizontal, moon-formed, beaked, covered with inoffensive, hooked prickles, one-seeded.

3. I. *aspalathifolia. Roxb.*

Shrubby. *Leaves* fascicled, wedge-shaped, smooth. *Peduncles* axillary, solitary, one-flowered. *Legumes* straight.

Manneli. *Rheed. Mal.* ix. *t.* 37.

Aspalathus *Indica. Linn.*

A small, branchy shrub, common on dry sandy lands near the sea. Flowers during the

rainy and cold seasons. Page Carey Ed.

Stem short, small. *Branches* numerous, spreading in every direction, small but very hard; *bark* dark purple. *Leaves* simple, fascicled, wedge-formed, small, smooth. *Peduncles* axillary, the length of the leaves, one or two-flowered. *Flowers* small, red. *Keel*, daggers slender, but long and sharp. *Legumes* horizontal, cylindric, smooth, pointed from six to ten-seeded.

4. I. *trita. Willd.* iii. 1228.

Annual and biennial, erect, rigid. *Leaves* ternate; *leaflets* obovate. *Racemes* axillary, sessile, many-flowered. *Legumes* reflexed, straight, rigid, four-sided, spinous, pointed, smooth. III.

A native of various parts of India. In flower all the year. It grows rather tall in a good soil, but is thin of branches, and rather a hostile looking plant, when growing in a bad soil. 372

Note. This is the only species I can compare to I. *trifoliata*, and as I have reared it from seeds received from Dr. Klein of Tranquebar, under that name, am inclined to think they are the same.

5. I. *cinerea. Willd.* iii. 1225.

Shrubby, hoary. *Leaves* ternate; *leaflets* oblong, acute, hoary. *Racemes* axillary, subsessile. *Legumes* horizontal, four-sided, with sharp thorny points.

Teling. Veri neelli.

A thin, poor looking, shrubby species, grows on dry uncultivated ground often on road sides. Flowers during the wet and cold seasons.

Stem short, woody. *Branches* numerous, bent in every direction, very rigid, covered with hoary bark; the plant in general about two or three feet high. *Leaves* scattered, ternate, petioled. *Leaflets* oblong, or broad lanceolate, acute, entire, a very little hairy, and hoary, smaller than in any other of this family that I know, I. *aspalathifolia* excepted. *Petioles* channelled. *Stipules* subulate. *Racemes* axillary, sub-sessile, the length of the leaves. *Flowers* small, red. *Legumes* horizontal, four-sided, very sharp pointed, from six to seven-seeded; *seeds* remote.

Note. It seems to agree better with the description of I. *trita*, in the *Supplement* of Linnæus, than *trita* itself. Can there be any mistake? This species is immediately distinguished from that, by being much more branchy, very white or hoary, and by the form of the leaflets, which in that are obovate, and emarginate; in this broad-lanceolar, and acute.

6. I. *glandulosa. Willd.* iii. 1227. III.

Suffrutex, diffuse. *Leaves* ternate; *leaflets* somewhat wedge-shaped. *Heads* axillary. *Legumes* oval, with four elevated, prickly angles, two-seeded. 373

Teling. Baragadam.

A small shrubby species; a native of moist rich lands amongst the mountains. Flowers, and ripens its seeds during the wet and cold seasons.

Root woody, white. *Stem* erect, woody, branchy. *Branches* numerous, the lower ones are longer than the stem, resting on the ground, and often striking root, round, coloured. *Leaves* numerous, approximate, ternate, petioled. *Leaflets* oblong, or wedge-formed, entire, with downy points, and the underside covered with innumerable glands, probably vesicles filled with an essential oil; about an inch long, and half an inch broad. *Stipules* broad. *Racemes* axillary, sessile, oval, dense, many-flowered. *Flowers* small, red. *Bractes* solitary, one-flowered. *Keel* hairy, discoloured; *daggers* very large, long, and sharp. *Legumes* reflexed, oval, four-sided; *angles* armed with lacerated prickle-like wings, two-seeded. *Seeds* separated by a partition.

Of the seeds the natives of the hilly countries make meal, which they bake into bread, and use as an article of diet; when more agreeable food is scarce. Cattle are fond of the plant.

7. I. *prostrata. Willd.* iii. 1226.

Perennial. *Leaves* ternate; *leaflets* wedge-shaped, with glandular dots. *Racemes* axillary, sessile, the length of the petioles. *Legume* reflexed, smooth, acute, from six to eight-seeded.

This species is a small shrubby perennial; a native of the borders of cultivated lands, with a trifling, erect stem, and many longer, prostrate, round, woody, somewhat hairy branches, with ascending extremities. *Leaves* exactly as in the last, (I. *glandulosa.*) *Stipules* scarcely any. *Racemes* axillary, sessile, shorter than the leaves, many-flowered. *Flowers* small, red. III. *Bractes* single, subulate, one-flowered. *Legumes* reflexed, rigid, a little compressed, from six to eight-seeded. 374

8. I. *argentea. B. H.*

Shrubby. *Leaves* from single to quinate-pinnate; *leaflets* lanceolate, acute. *Racemes* longer than the leaves. *Legumes* reflexed, curved, contracted between the seeds, hoary.

A rare shrubby species; growing about the borders of cultivated lands, near hedges, trees, &c. where it meets with a rich sweet soil. Flowering time the wet season.

Stem scarcely any. *Branches* numerous, woody, spreading, pretty smooth. *Branchlets* alternate, nearly bifarious, hoary. *Leaves* alternate, approximate, nearly bifarious, from simple to pinnate, the lowermost on the branchlets are single, the next above paired, then ternate, &c. up to pinnate. *Leaflets* alternate, lanceolate, acute, entire, hoary, chiefly on the under side; size various, from half an inch, to an inch and a half long; all are about three-eighths broad. *Petioles* hoary, channelled, when bearing leaflets, winding. *Stipules* awled, with a callous projecting horn at the base. *Racemes* axillary, much longer than the leaves, many-flowered. *Flowers* small, red, single. *Bractes* oval, one-flowered, falling. *Legumes* reflexed, falcate, contracted between the seeds. *Seeds* from four to eight.

9. I. *uniflora* of Dr. Buchanan.

Perennial. *Branches* diffuse, long, slender, and coloured. *Leaves* sub-sessile, digitate

Page Carey Ed. *leaflets* cuneate. *Flower* solitary. *Legume* three-seeded.

Mannella. *Rheed. Mal.* ix. *t.* 37.

Aspalathus *Indica. Willd.* iii. 963.

Lotus tenuifolius. *Pluck. Alm. t.* 201. *f.* 2.

A native of Mysore, from thence the seeds were sent by Dr. Buchanan to the Botanic garden, where the plants thrive luxuriantly, and continue in blossom great part of the year.

III. 375 *Root* perennial. *Stem* scarcely any, but numerous, pretty long, very slender, red, bifariously ramous branches, spreading close on the surface of the earth, but I never found them strike root, covering, in the rich soil of Bengal, a space of three or more feet in diameter. *Leaves* generally in fives, three on the apex of a very short common petiole, the other two on opposite sides of its base, stipulaceous, all cuneate, pretty smooth, and entire; scarcely a quarter of an inch long, and about a line broad. *Stipules* only some soft hairs about the insertion of the leaves. *Peduncles* axillary, solitary, longer than the leaves, very slender, one-flowered. *Flowers* small, red. *Legumes* linear-oblong, round, sprinkled with a few short hairs, containing from two to four seeds.

10. I. *fragrans. Willd.* iii. 1231. *Retz. Obs.* iv. 29.

Suffruticose. *Leaves* from ternate, to pinnate; *leaflets* oval. *Stipules* lanceolate, hairy. *Peduncles* axillary, as long as the leaves, few-flowered. *Legumes* straight, from ten to twelve-seeded.

Colutea siliquosa. *Pluk. Alm. t.* 166. *f.* 1. good.

I. *glabra. Willd.* iii. 1231.

I have not found any other species which can be compared to the above quoted one, and suspect it to be the same. My plant is almost destitute of pubescence as it is only on the stipules, petioles, and under side of the leaves, where a little is to be found, particularly while young.

A native of Coromandel; where, like the rest of the genus, it flowers in the rains and cool season.

11. I. *flaccida. Kön. Mss.*

Perennial, flaccid. *Leaves* pinnate; *leaflets* from two to three-paired, oval, smooth. *Racemes* twice the length of the leaves. *Legumes* reflexed, curved, sub-cylindric, many-flowered.

III 376 This slender perennial species grows chiefly amongst bushes, on dry barren ground. *Stem* woody, weak, supporting itself on bushes. *Branches* more so, smooth; the *young parts* of a bright green; from one to four or five feet long. *Leaves* scattered, pinnate, about two inches long. *Leaflets* from two to three pair with an odd one, equal, oval, smooth, triflingly acute; about three quarters of an inch long, and half an inch broad. *Stipules* subulate, frequently coloured. *Racemes* axillary, peduncled, twice as long as the leaves, round, smooth, many-flowered. *Flowers* pretty large, red. *Bractes* single, subulate, one-flowered. *Legumes* reflexed, slender, round, falcate, from six to twelve-seeded.

12. I. *enneaphylla. Willd.* iii. 1229.

Perennial, procumbent. *Leaves* pinnate, sub-sessile; *leaflets* minute, four-paired, obovate, smooth. *Spikelets* oval, sessile. *Legumes* oval, two-seeded.

Teling. Chera-gaddam.

This helps to form our very best, and most beautiful pasture lands, where it is always found in plenty. It is perennial. Flowers all the year round.

Stem none, but it has many, ramous, prostrate, bifarious branches spreading in every direction, close upon the ground, round, a little downy, and in general from six to twelve inches long. *Leaflets* minute, opposite, from three to five pair, obovate, smooth, entire. *Stipules* semi-lanceolate. *Spikes* axillary, oval, sessile, many-flowered. *Flowers* small, of a bright red. *Legumes* oval, smooth, two-seeded, interrupted between them. Cattle eat it greedily.

13. I. *hirsuta. Willd.* iii. 1233.

Annual, and biennial, erect, ramous, hairy. *Leaves* pinnate; *leaflets* three or four pair, obovate, hairy. *Stipules* linear. *Racemes* longer than the leaves. *Legumes* reflexed, hairy, four or five-seeded.

Teling. Penni vempali.

Astragalus spicatus. *Burm. Zeyl. t.* 14.

III. Kattu-tagera. *Rheed. Mal.* ix. *t.* 30.

377 A native of Coromandel. It flowers during the rainy and cold seasons.

14. I. *viscosa. Willd.* iii. 1236.

Somewhat shrubby, hairy and glutinous. *Leaves* pinnate; *leaflets* from four to five-paired, long-obovate. *Racemes* longer than the leaves. *Legumes* straight, hairy, from six to eight-seeded.

Galega *colutea. Burm. Ind.* 172. *Willd.* iii. 1246.

Colutea siliquosa. *Pluk. t.* 166. *f.* 3.

This species grows on a very sandy soil. It flowers during the wet and cold seasons.

Root simple. *Stem* somewhat shrubby, erect, very ramous, from one to three feet high; the young parts covered with white, depressed hairs, and other stiffer hairs with glutinous, enlarged, glandular extremities. *Leaves* alternate, pinnate, two or two and a half inches long. *Leaflets* from four to five pairs, opposite; obovate, entire; above pretty smooth; below hairy and glandular like the tender branches. *Stipules* filiform. *Racemes* axillary, peduncled, longer than the leaves, round, like the young branches. *Bractes* awled, one-flowered. *Flowers* rather remote, small, red. *Legumes* horizontal, straight, round.

15. I. *cærulea. Roxb.*

Shrubby, hoary. *Leaves* pinnate; *leaflets* four-paired, obovate, emarginate. *Racemes* rather shorter than the leaves. *Legumes* reflexed, curved, contracted between the seeds, hoary, from three to four-seeded. Page Carey Ed.

Teling. Karneeli.

This is an erect, shrubby species; growing on dry, barren, uncultivated ground to the height of three feet, and higher in good, garden soil. It flowers during the wet and cold seasons.

Stem erect, woody, as thick as a man's thumb or more, biennial or triennial, the length very various, but the whole plant, in its wild state, is generally about three feet high; where cultivated in a good soil it is often five or six feet high. *Branches* many, nearly erect, scattered, striated from the insertion of the leaves, three small ridges running down from each; entirely covered with great numbers of short, depressed, white hairs, which make the plants quite hoary; these may be easily rubbed off, leaving the branches, &c. smooth, clear and green. *Leaves* alternate, somewhat bifarious, numerous, approximated, pinnate with an odd one; about four inches long. *Leaflets* short-petioled, opposite, from three to five pairs, pale green, fleshy, the lower smallest, all obcordate, slightly emarginate with a minute bristle, above pretty smooth, but pale coloured; many short depressed white hairs cover the under side, which make it still of a fainter green than the upper side, but nothing like down on any parts of the plant, from one to two inches long, and about three quarters broad. *Petioles* covered with the same small, depressed, white hairs, channelled. *Stipules* awled, small. *Racemes* axillary, sessile, erect, shorter than the leaves, many-flowered. *Flowers* numerous, small, yellow and red. *Calyx; divisions* short, acute, equal. *Banner* and *keel* hairy; of a greenish-yellow, margins of the former involute. *Wings* of a pale rose colour, linear-oblong, processes of the keel remarkably large. *Legumes* numerous, reflexed, falcate, round, short, covered with the same hairs as the branches, and contracted a little between the seeds. *Seeds* generally three, smooth, like those of I. *tinctorea.* III. 378

This species comes near to *Indigofera argentea, Linn.* the chief differences are, that in this plant there is a total want of down; the leaves are never ternate, but always composed of from three to five pair of leaflets, with a larger single terminal one; and the legumes are very numerous on the same racemes.

From the leaves of this plant I have often extracted a most beautiful, light Indigo; more so than I ever could from the common Indigo plant, or even from *Nerium tinctorium,* and in a large proportion. After an enquiry of nearly two years, I have not been able to discover that the natives of any parts of India make use of it. The process by which I obtained the colour from the leaves, was exactly similar to that practised for obtaining the Indigo from the leaves of *Nerium tinctorium,* viz. by committing them while fresh, to cold water, and scalding them over a moderate fire, to about one hundred and sixty degrees of Fahrenheit's thermometer, the liquor will then have attained a beautiful deep greenish yellow colour; it is then strained off clear, and while hot, gently agitated in a broad, shallow, open vessel for a few, (twenty to thirty) minutes; during which time it changes its colour, gradually becoming darker and darker and more turbid when sufficiently agitated, if a little of it be viewed in a clean silver spoon, or any other vessel that reflects the light, a muddiness, or minute grain may be easily seen, which is rendered large, and copious by the addition of a little lime-water; this fœcula readily falls to the bottom, the superincumbent liquor is then poured off, and will be more or less of a clear brandy colour, according as the operation has been successfully conducted; for the more this liquor is tinged with green, the less perfectly has the colour been separated; and the produce, of course the more deficient and less beautiful. How to effect the most perfect separation, and precipitation of the colour, is the grand desideratum with our Indigo manufacturers, and well deserves the chemist's most serious attention. III. 379

16. I. *tinctoria. Willd.* iii. 1237.

Shrubby. *Leaves* pinnate; *leaflets* about five-paired, long-obovate, smooth. *Racemes* shorter than the leaves. *Legumes* reflexed, nearly straight, smooth, about ten-seeded.

Pers. Derukht-neel, the plant; and Neelep the Indigo.

Arab. Izlum, or Lee-lunj the plant; and Neelep the Indigo.

Sans. Nili.

Beng. Nil, or Neel.

Teling. Neel.

Ameri. *Rheed. Mal.* i. *t.* 54.

Indicum. *Rumph. Amb.* v. *t.* 80. III. 380

Native place uncertain, for though now common in a wild state over most parts of India, yet is in general not remote from places where it is or has been cultivated.

17. I. *violacea. R.*

Shrubby. *Leaflets* six pair, oblong. *Racemes* axillary, half the length of the leaves. *Legumes* straight, sub-cylindric, smooth, from six to ten-seeded.

A native of the mountains about Hurdwar, where the seeds were collected by Mr. George Roxburgh, and sent to the Botanic garden, where the plants thrive well, and blossom in February and March, at which time the shrub is uncommonly ornamental, especially when the flowers begin to fade, the rosy tinge then changing to a lively violet.

18. I. *elliptica. Roxb.*

Shrubby. *Leaflets* six pair, exactly elliptic; smooth. *Racemes* axillary, and from the naked branches, the length of the leaves. *Legumes* divaricate, straight, smooth, eight-seeded.

A stout, shrubby, ramous, tolerably erect species; a native of the eastern parts of Ben-

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gal. Flowering time the cool and beginning of the hot season, when the plant is nearly destitute of leaves.

Leaves pinnate, from three to six inches long. *Leaflets* from four to eight pair, very exactly elliptic, being equally rounded at each end, and all nearly equal; smooth on both sides; about an inch long, by half of an inch broad, and generally deciduous during the cool season. *Stipules* minute, hairy. *Racemes* axillary, but more generally from the leafless branchlets of the former year, scarcely so long as the leaves, a little hairy. *Bractes* oval, concave, ciliate, one-flowered, caducous. *Flowers* pretty large, of a bright, lively pink. *Legumes* straight,
III. somewhat four-sided, divaricate, smooth, acute, from six to ten-seeded.
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19. I. *arborea. Roxb.*

Arboreous. *Leaves* pinnate; *leaflets* from six to nine pair, oval, emarginate. *Racemes* the length of the leaves. *Wings* expanded. *Legume* fluted, straight, smooth.

This stately species was reared in the Botanic garden from seed sent from the Shreenagur mountains by Captain Hardwicke in 1796. Time of flowering, at Calcutta, the month of March.

Trunk erect, in twelve years as thick as a man's leg. *Bark* dark brown. *Branches* numerous, spreading in every direction; *young shoots* somewhat scabrous, height of the whole plant, when twelve years old, about twelve feet. *Leaves* alternate, pinnate, about four inches long. *Leaflets* from six to nine pair, oval, emarginate, somewhat scabrous with very short hairs. *Stipules* subulate. *Racemes* axillary, solitary, nearly the length of the leaves. *Flowers* solitary, short-pedicelled, large, and of a very beautiful, bright, reddish-violet colour. *Legumes* linear, smooth, reflexed, sharp pointed, containing from six to twelve seeds.

20. I. *atropurpurea. Buch.*

Shrubby, erect. *Leaves* pinnate; *leaflets* from six to eight pairs, oval, smooth. *Racemes* when in flower, as long as the leaves in seed twice their length. *Legumes* cylindric, straight, reflexed, from eight to nine-seeded.

A native of Nepal, from thence introduced by Dr. Buchanan, into the garden in 1802, and in about eight months the plants they produced were from three to five feet high, with a simple, shrubby, straight stem and few branches, with young tender parts somewhat villous.

Leaves pinnate, from six to twelve inches long. *Leaflets* opposite, from six to eight pair, short-petioled, oval, entire, smooth on both sides, an inch and a half long, by one inch broad.
III. *Stipules* subulate; those of the petioles caducous; those of the leaflets, for each pair has a pair
382 or more, permanent. *Racemes* axillary, by the time all the flowers have fallen, considerably longer than the leaves, even twice their length. *Flowers* numerous, scattered, before expansion imbricated, large, of a dark purple. *Bractes* one-flowered. *Legumes* cylindric, smooth, reflexed, from six to twelve-seeded.

The same plant has been reared from American seeds sent without a name from Philadelphia by William Hamilton, Esq.

21. I. *pulchella. Roxb.*

Shrubby, erect. *Leaves* pinnate; *leaflets* from eight to ten-paired, obovate. *Racemes* longer than the leaves. *Legumes* reflexed, straight, smooth, from ten to twelve-seeded.

An erect, ramous shrub.

Stem and *branches* round, smooth; *bark* dark rust coloured. *Leaves* scattered, pinnate, with an odd one, from four to six inches long. *Leaflets* from eight to ten-paired, obovate, somewhat emarginate with a little bristle, a little hairy, three-fourths of an inch long, by one half broad. *Stipules* awled, falling off long before the leaves are fully expanded. *Racemes* axillary, longer than the leaves, short-peduncled. *Flowers* numerous, large, rose-coloured. *Bractes* lanceolate, concave, one-flowered, falling. *Legumes* cylindric, smooth, reflexed, an inch or an inch and a quarter long, from ten to twelve-seeded.

22. I. *uncinata. R.*

Shrubby, with far extended branches. *Leaflets* from eight to ten pair, elliptic. *Spikes* sessile, much shorter than the leaves, dense. *Daggers* of the *keel* hooked, and obtuse. *Legumes* erect, subulate, many-seeded.

A native of Pegu, from thence introduced into the Botanic garden, where it becomes a very stout shrub, with far extended branches; the young shoots and leaves slightly clothed
III. with minute white hairs. *Stipules* small, subulate. *Flowers* very much crowded, reflexed,
383 banner and keel of a pale greenish yellow, wings small and red. *Legumes* long, cylindric, perfectly erect, five-pointed. It flowers in the rains, and the seed ripens in the cool season.

23. I. *purpurescens. R.*

Sub-arboreous. *Bark* a little scabrous. *Leaves* pinnate. *Leaflets* ten pair, from oval to broad-elliptic, sub-emarginate, a little hairy. *Racemes* axillary and from the leafless branches, length of the leaves.

A native of the interior of the peninsula of India. In the Botanic garden it has in two years grown to be a stout small tree, with a distinct trunk, and numerous spreading branches. It flowers in February and March, at which time few plants surpass it in beauty, the flowers being large, very numerous, and of a bright rose-colour changing to lively purple. Seed ripens in May.

24. I. *virgata. R.*

Shrubby. *Leaves* pinnate; *leaflets* as far as twelve pair, sub-alternate, or opposite, linear-oblong. *Racemes* the length of the leaves.

A native of Nepal. In the Botanic garden at Calcutta it flowers during the hot season, March, April and May.

GALEGA. Schreb. gen. N. 1206.

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Calyx with subulate teeth, nearly equal. *Legume* with oblique streaks between the seeds.

1. G. *spinosa. Willd.* iii. 1250.

Suffruticose, hoary. *Leaflets* minute, about nine, wedge-shaped. *Stipules* spinescent. *Flowers* axillary. *Legumes* scimitar-shaped, horizontal, smooth, about six-seeded.

Teling. Mullo-yampalli.

A small ramous species, a native of dry barren lands on the coast of Coromandel. III.

2. G. *pentaphylla. Roxb.* 384

Shrubby, ramous, erect, hoary. *Leaflets* five, cuneate, emarginate, sericeous underneath. *Stipules* subulate. *Flowers* axillary, one or two. *Legumes* linear, incurved, villous.

Seeds sent by Mr. B. Heyne from Mysore in 1801, to the Botanic garden, produced many very ramous thriving shrubs by plants, which blossomed when about one year old, and were then from one to three feet in height.

Trunk scarcely any, but numerous, cinereous, ligneous branches spreading in every direction. *Leaves* alternate, pinnate. *Leaflets* two pair, with a terminal single one, which is by far the largest, all are cuneate, emarginate, above pretty smooth, underneath clothed with appressed, soft white hairs, from one to two inches long. *Petioles* short, hairy, channelled. *Stipules* subulate. *Flowers* axillary, one or two together, short-peduncled, middle-sized, of a dull pale red colour. *Legumes* spreading, linear, incurved, villous, from six to eight-seeded.

3. G. *Heyneana. Roxb.*

Shrubby, ramous. *Leaves* bifarious; *leaflets* from five to seven, oval, and oblong, tomentose underneath. *Racemes* axillary, the length of the leaves. *Stipules* conical. *Legumes* straight, pendulous, villous.

Reared in the Botanic garden from seed sent by Mr. B. Heyne, from Mysore, where the plant is indigenous. Flowering time in Bengal, the cold season.

Stem straight; *branches* ascending, flexuose, tomentose; the height of the plants in the Botanic garden when about eighteen months old, three feet. *Leaves* alternate, bifarious, pinnate. *Leaflets* from three to seven, the lower pair much smaller, inserted on the very base of the petioles, close to the stipules; the rest gradually larger, and more lengthened in proportion to their breadth; all are clothed with much soft, close, light coloured down on the under side, III.
and almost smooth above. *Petioles* downy, channelled. *Stipules* triangular, tapering to an 385
acute point. *Peduncles* axillary, solitary, downy, about as long as the leaves, bearing a few, dull reddish, pretty large flowers, at and about the apex only. *Bractes* the exterior two three-fold, three-flowered; the inner series uncertain. *Calyx* downy. *Banner* of a dark brownish red, villous on the back. *Legumes* drooping, straight, slightly villous, from eight to twelve-seeded.

4. G. *incana. Roxb.*

Shrubby, diffuse, flexuose, hoary with white down. *Leaflets* six pairs, obovate, emarginate, hoary. *Stipules* taper-triangular. *Racemes* terminal. *Legumes* reflexed, falcate, very hairy.

A native of Mysore.

Stem scarcely any, but numerous, flexuose *branches*, and *branchlets*, spreading to a considerable extent; *young parts* clothed with erect, soft, white down. *Leaves* alternate, pinnate, from three to four inches long. *Leaflets* from five to eight pair, obovate, deeply emarginate, hoary, particularly the margins, and the lower side. *Stipules* reflexed by age, triangular, acute. *Racemes* terminal, long, and downy. *Bractes* three-fold, three-flowered. *Flowers* short-pedicelled, the middle one of the three expanding long after the other two. *Calyx* clothed with much fulvous pubescence. *Legumes* bending back close to the rachis of the racemes, much curved, very hairy, from six to eight-seeded.

5. G. *villosa. Willd.* iii. 1245.

Shrubby, diffuse, flexuose, somewhat hoary. *Leaflets* from six to eight pair, cuneate, subretuse. *Stipules* ensiform, recurved. *Racemes* terminal. *Bractes* three-fold, two-flowered. *Legumes* reflexed, sickle-shaped, hairy, from five to six-seeded.

Coronilla zeylanica. *Burm. Zeyl.* 78. *t.* 33. III.

A native of various parts of India, in blossom and seed greater part of the year. These 386
plants delight most in the sandy lands at no great distance from the sea.

6. G. *purpurea. Willd.* iii. 1247.

Shrubby, sub-erect, smooth. *Leaflets* about seven pair, cuneate, smooth. *Stipules* filiform. *Racemes* terminal. *Bractes* three-fold, subulate, three-flowered. *Legumes* ascending, sickle-shaped; smooth, from six to seven-seeded.

Coronilla zeylanica herbacea. *Burm. Zeyl.* 77. *t.* 32.

A native of the sandy lands of the coast of Coromandel, and in blossom most part of the year.

7. G. *lanceæfolia. Roxb.*

Shrubby, dichotomous. *Leaflets* from thirteen to nineteen, lanceolar. *Stipules* subulate. *Racemes* terminal, and lateral; *rachis* angular. *Bractes* ensiform, many-flowered. *Legumes* falcate, smooth, from three to five-seeded.

A native of the sandy lands near the shores of Coromandel. Flowering time the close of the rains, and cool season.

Shrubby, with numerous, dichotomous, round, pretty smooth, coloured, ascending branches; the general height of full grown plants in the Botanic garden is about two feet. *Leaves* pinnate; *leaflets* from five to eight or nine pairs, and a terminal one, opposite, short-petiolate,

Page Carey Ed. lanceolar, smooth above, a little villous and paler underneath; the largest about an inch long, and less than half an inch broad. *Petioles* channelled, a little villous. *Stipules* subulate, permanent. *Racemes* lateral, axillary, or terminal, about as long as the leaves. *Bractes* three-fold, ensiform, from three to six-flowered. *Flowers* of a deep bright purple, short-pedicelled. *Legumes* diverging, becoming rectilinear, smooth, incurve-falcate, three, four, or five-seeded, and contracted on the side between them.

III. 387 8. G. *tinctoria. Willd.* iii. 1248.

Shrubby, ramous, villous. *Leaflets* from thirteen to nineteen, obovate-cuneate, emarginate, villous underneath. *Stipules* subulate. *Racemes* longer than the leaves. *Bractes* tern, more than two-flowered, in succession. *Legumes* spreading, slightly falcate, somewhat villous, from four to five-seeded.

A native of various parts of India, delighting in a warm sandy soil. Flowering time the rains, and cool season.

9. G. *diffusa. R.*

Shrubby, diffuse, scarcely villous. *Leaflets* from eleven to twenty-one, sub-cuneate, emarginate. *Stipules* subulate. *Racemes* terminal. *Legumes* diverging from the rachis, straight, nearly smooth, from six to seven-seeded.

A native of the Circars, in flower and ripe seed most part of the year, but more frequently from the close of the rains to the end of the cool season.

ASTRAGALUS. Schreb. gen. N. 1208.

Legume two-celled, gibbous.

A. *hamosus. Willd.* iii. 1279.

Caulescent, procumbent. *Legumes* subulate, recurved, smooth. *Leaflets* obcordate, villous underneath.

A native of Persia flowering in the cold season in the Botanic garden.

PSORALEA. Schreb. gen. N. 1210.

Calyx sprinkled with callous points, the length of the one-seeded legume.

1. P. *corylifolia. Willd.* iii. 1351. *Burm. Ind.* 172. *t.* 49. *f.* 2.

III. 388 Annual, erect, from three to four feet high. *Leaves* simple, rarely ternate; ovate-cordate, scallop-toothed. *Stipules* recurvate. *Racemes* long-peduncled. *Bractes* three-flowered.

Teling. Kor-Gestum.

Beng. Hakooch.

A native of various parts of India, and commonly found in the vicinity of villages during the rainy and cold seasons.

2. P. *obovata. Roxb.*

Shrubby. *Leaves* ternate; *leaflets* obovate, villous underneath. *Flowers* lateral, long-pedicelled, several on a short common peduncle. *Legumes* tapering to a very long mucronate point, downy.

A native of the country about Hurdwar, where Captain Hardwicke found it in flower and seed in April.

TRIFOLIUM. Schreb. gen. N. 1211.

Flowers sub-capitate. *Legume* scarcely longer than the calyx, gaping, deciduous.

1. T. *Indicum. Willd.* iii. 1353.

Annual, erect. *Leaflets* cuneate, serrulate. *Stipules* subulate. *Racemes* elongated. *Legumes* rugose, oval, or two-seeded.

Beng. Bun-methee.

Suendadi-pullu. *Rheed. Mal.* ix. *t.* 40.

Melilotus humilis erecta, &c. *Pluck. Alm. t.* 45. *f.* 5.

A native of various parts of India, appearing during the dry season from October till March, when the seeds are ripe, and then it perishes.

2. T. *officinale. Willd.* iii. 1355.

Annual, erect. *Leaflets* obovate, serrate. *Stipules* subulate. *Racemes* elongated. *Legumes* naked, globular, one-seeded.

Melilotus lutea, &c. *Pluk. Alm. t.* 45. *f.* 4.

III. 389 *Beng.* Bun-piring.

A native of Bengal, and, with the last, appears during the dry season only.

TRIGONELLA. Schreb. gen. N. 1218.

Banner and *wings* sub-equal, expanding in form of a three-petalled corol.

1. T. *Indica. Willd.* iii. 1403.

Herbaceous, procumbent. *Leaflets* lanceolar, entire. *Peduncles* axillary, from two to four-flowered. *Legumes* straight, cuspidate.

Lotus madraspatensis, &c. *Pluk. Alm. t.* 200. *f.* 7. good.

A native of Coromandel. In flower all the year.

2. T. *Foenum græcum. Willd.* iii. 1402.

Annual, erect. *Legumes* sessile, long, straight, with filiform point.

Arab. Hulbeh.

Beng. Methee. Page Carey Ed.
Teling. Mentee.
Is much cultivated in many parts of India, particularly in the higher, inland provinces.
3. T. *corniculata. Willd.* iii. 1400.
Annual, diffuse. *Leaflets* obovate, serrate. *Stipules* lanceolate-dentate. *Peduncles* longer than the leaves. *Heads* many-flowered. *Legumes* sickle-shaped, smooth, many-seeded.
Sans. Lunkaika.
Beng. Piring. The plant is cultivated as a pot-herb during the cold season.

MEDICAGO. Schreb. gen. N. 1214.

Legume compressed, bent in. *Keel* bent down from the banner. III.
M. *polymorpha.* 390
Legumes spiral. *Stipules* toothed. *Stem* diffused.
Two varieties of this are found wild, on loose sandy soil, on the banks of the Ganges, towards Hurdwar; one is M. *hispida* of Gærtner, the other I am less certain of.

CLASS XVIII.

POLYADELPHIA ICOSANDRIA.

CITRUS. Schreb. gen. N. 1218.

Calyx five-cleft. *Petals* five. *Stamina* twenty or more, united into several distinct bodies. *Berry* many-celled.
1. C. *acida. R.*
Sub-arboreous, armed. *Petioles* more or less winged; *leaves* from oval to oblong, and ovate-oblong, crenate, obtuse. *Corol* generally four-petalled.
Malus limonia acida. *Bauh. Pin.* 436.
Sans. Jumbira, or Jumbeera. This name applies equally to all the varieties.
Beng. Leboo, Neboo.
Under the above definition I mean to comprehend the various varieties, if not species, of the sour lemons or limes found in India, and as the petioles are very generally winged I think it necessary to separate them from the lemons and citrons which have not that mark, or have it in a very trifling degree.
In Bengal the following sorts have come under my inspection, the whole being cultivated III.
under my own eye, in the Botanic garden, and are arranged according to the estimation in 391
which they are held by both natives and Europeans.
1*st.* Pati-Leboo, or Neboo. *Fruit* oval, about two inches long by one and a half or one and three quarters in diameter; *apex* rather pointed; *skin* thin and smooth, when ripe yellow, from eight to ten-celled, abounding in pale coloured very acid juice.
2*nd.* Kaguji-Neboo. Like the last a small, very ramous, well armed tree. *Petioles* winged. *Fruit* oblong, smooth, thin-skinned, when ripe yellow, vertical diameter from two to two and a half inches, and from four to six in circumference; it ripens in July and yields a large proportion of sharp acid, pale juice.
3*rd.* Gora-Neboo. The tree is one of the smallest, but very ramous, and equally armed. *Petioles* less winged than in the other varieties. *Fruit* oval, with a protuberant base. *Skin* rather thick, rougher than in the first two varieties; the vertical diameter about three inches, and the circumference from six to eight; it ripens in September, and is then yellow, with juice as in the former varieties.
4*th.* China-Gora-Neboo. This variety was twenty years ago introduced from China. The tree is rather small but equally ramous and armed with the others. *Fruit* round, the vertical and transverse diameter being the same, and generally about two inches; it ripens in August, and contains abundance of rich looking, pale yellow, acid juice.
5*th.* Camaral-Neboo. A rather large, but thinly branched tree. *Fruit* long-oval; *skin* thin, and smooth; the vertical diameter four or five inches, and from eight to twelve in circumference; it ripens in November, is then remarkably full of pale juice.
A small one which weighed eighteen ounces, yielded just half that weight of juice.
6*th.* Rungpore Lime; the vernacular name not ascertained. A very small tree, or shrub, with but few small thorns. *Fruit* perfectly spherical, the size of a small orange, being six or III.
seven inches in circumference; small, with a thin skin, of a light lively yellow colour; juice 392
pale, and acid.
7*th.* Taba-Neboo. A small, ramous, very thorny tree, with the petioles winged. *Fruit* nearly round; *skin* thick, spongy like the citron, pretty smooth, from twelve to eighteen inches in circumference; it ripens in November, and contains several ounces of very acid juice.
8*th.* Arabian Lime from Muscat. The trees are young, and have not attained their full growth. *Fruit* nearly spherical, about the size of a small shaddock; *skin* thick, and spongy, like the citron, and externally very uneven.
9*th.* Meetha Lemoo, *i. e.* sweet lime. A small, very ramous, well armed tree. *Fruit* round, very smooth and thin-skinned, in general about the size of a small orange; juice insipidly sweet.

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2. C. *medica. Willd.* iii. 1426.
Petioles linear; *leaves* ovate, acuminate.
Beng. Lemoo or Nemoo.
Lemon tree.

On the continent of India, it is found in gardens, where it blossoms most plentifully during the hot season, and the fruit ripens about the close of the rains.

The citron (*Sans.* Beeja-poora, *Arab.* Utrej, *Pers.* Turcre, *Hind.* Bejoura) is likewise found common in gardens, where it blossoms, and bears fruit abundantly the whole year. There are now, besides the large rough-skinned common citrons, three varieties or species in the Botanic garden reared above twelve months ago, from seed from the Garrow hills where they are found indigenous in the forests.

3. C. *Aurantium. Willd.* iii. 1427.
Petioles winged. *Leaves* acuminate.
Sans. Nagarunga.
Arab. Narunj.
III. *Beng.* Kumla-neboo.
393 *Hind.* Narenj, Narangee; of the orange like the lime, we have many varieties to the eastward of the Cape of Good Hope, (See *Rumph. Herb. Amb. vol.* ii.) but as they do not thrive in any part where I have yet been stationed, I cannot well enter into any satisfactory account of them.

4. C. *decumana. Willd.* iii. 1428.
Petioles winged, *Leaves* obtuse, emarginate.
Beng. and *Hind.* Batavi-Neboo.
Limo Decumanus. *Rumph. Amb.* ii. 96. *t.* 24. *f.* 2.

Of this elegant useful tree, the shaddock, we have two varieties, one with white, and the other with red pulp, differing in size and quality, according to the soil, climate, and situation. On the continent of India so far as I know, we have the tree in our gardens only; the Bengalee name, viz. *Batavia lime,* denotes its being an exotic here.

5. C. *inermis. Roxb.*
Shrubby, unarmed. *Petioles* naked; *leaves* lanceolar, scarcely crenulate, obtuse.
Chin. Kum-quat.
Limonellus Madurensis. *Rumph. Amb.* ii. 110. *t.* 31.

A small, shrubby species; from China it has been introduced into the Botanic garden, where it blossoms in April.

Stem scarcely any, but numerous, unarmed, very ramous, smooth branches spreading and rising in every direction. *Leaves* alternate, petioled, lanceolar, some of them slightly crenulate, obtuse, smooth on both sides; from two to three inches long, and about one broad. *Petioles* about a quarter of an inch long, toward the apex margined. *Peduncles* axillary, generally solitary, the length of the petioles, one-flowered. *Calyx* small, flat, five-toothed. *Petals* five, lanceolate, recurved. *Filaments* variously united. *Anthers* from ten to fifteen.
III. *Germ* superior, with the base surrounded with a fleshy ring, from four to five-celled, with
394 from one to three ovula in each, attached to the axis. *Style* the length of the stamina. *Stigma* large and clammy.

POLYADELPHIA POLYANDRIA.

MELALEUCA. Linn. Gœrt. Smith, &c.

Calyx five-parted, semi-superior. *Corol* five-petalled. *Stamina* about forty-five, very long, conjoined in five bodies. *Style* single. *Capsules* three-celled. *Seeds* numerous.

1. M. *Cajuputi. Pharm. Lond.* 1809.*

Branchlets pendulous. *Leaves* alternate, sub-vertical, narrow-lanceolar, three, rarely five-nerved. *Spikes* terminal and axillary, comose, villous. *Bractes* lanceolate, three-flowered.

Arbor alba minor, Cajuputi, Daun kitsjil, and Caju-Kilan. *Rumph. Amb.* ii. *p.* 76. *t.* 17 *f.* 1.

This elegant, useful, small tree, is a native of the Molucca Islands; and as it is from its leaves that the valuable medicine called *Cajuputi oil* is obtained, it became an object of importance to try if it would grow in Bengal, where the medicine is frequently used with the best success. During my absence at the Cape of Good Hope, on account of bad health in 1798, Dr. John Fleming had charge of the Botanic garden; at the same time Mr. Smith, the nur-
III. seryman, was employed on the Molucca Islands, collecting plants for the garden, consequently
395 it was an excellent time for obtaining growing plants of the tree; Dr. Fleming therefore gave Mr. Smith strict orders to be very careful to get the proper sort, two or three being mentioned by Rumphius, from which the best oil was obtained. This commission Mr. S. executed to our satisfaction, many thriving plants having been sent to the garden by the close of the year, where they continue to grow freely, and in six and seven years they began to blossom

* With the compilers of the *Pharmacopœia* of the Royal College of Physicians of London for 1809, I agree in supposing the essential oil called *Cajuputi* is prepared from the leaves of the small *Melaleuca* called by Rhumphius *Arbor alba minor;* and also that this tree is specifically different from his *Arbor alba major, Herb. Amb.* ii. *p.* 72. *t.* 16. *(Melaleuca Leucadendron,)* but I think the trivial name *Cajuputi.* which they have given to this species, may lead to a wrong conclusion, because that Malay appellation is more directly that of *Arbor alba major.*

at various times of the year, which they have hitherto continued to do, and to ripen their seeds perfectly. From them numerous plants have been reared, and not only distributed over many parts of the continent of India, but sent to various other quarters of the world. It is from the original young trees, now (1811,) thirteen years old, that the following description and the accompanying figures are taken. Page Carey Ed.

Trunk tolerably erect, but crooked; and slender for the age of the trees. *Bark* of a very light or whitish ash-colour, soft, thick, and spongy, pretty smooth on the surface, the exterior lamina peels off from time to time in thin flakes, like that of the birch tree; and the interior part may be separated into numerous lamina, like the leaves of a book. *Branches* scattered, with the slender twigs often drooping as completely as in the weeping willow, they are round and smooth; *young shoots* sericeous; height of the young trees (thirteen years,) above-mentioned about twelve feet, and the thickest part of the trunk not more than a man's leg, including the bark, which is three quarters of an inch thick. *Leaves* alternate, projecting in every direction, but most frequently vertical, short-petioled, narrow-lanceolar, while young sericeous, sometimes slightly falcate, entire; from three to five inches long, and from half to three quarters of an inch broad; on being bruised they smell strong of the balsam they yield, yet the cells which contain this aromatic fluid, are scarcely visible in the fresh leaves. *Spikes* terminal, and from the extreme axills, downy, while in flower there is only a scaly conic bud at the apex, which soon advances into a leafy branchlet. *Bractes* solitary, lanceolate, sericeous, three-flowered, caducous. *Flowers* tern, sessile, small, white, inodorous. *Calyx* urceolate, semi-supera, sericeous; *margins* of five semilunar deciduous segments. *Petioles* five, orbicular, short-clawed, white, much longer than the segments of the calyx. *Filaments* from thirty to forty, united into five portions at the base, three or four times longer than the petals, and with them inserted into the large, villous, five-lobed rim of the calyx, alternate with its segments. *Anthers* ovate-cordate, with a yellow gland on the apex. *Germ* ovate, with the lower half united to the calyx, three-celled, with numerous ovula in each attached to an elevated receptacle in the inner and lower angle of each cell. *Style* rather longer than the stamina. *Stigma* obscurely three-lobed. *Capsules* completely enveloped in the thick, fleshy, gibbous, permanent calyx, three-lobed, three-celled, three-valved; *valves* thin, hard, and elastic, opening from the apex. *Partitions* contrary. *Receptacles* triangular, thin, flat, lodged in the inner and lower angle of the cell. *Seeds* numerous, angularly wedge-shaped. III. 396

It is readily cultivated both by the root and seed; when by the root, slender pieces thereof cut into little bits, and laid horizontally in the earth, during the rainy season, soon produce plants.

From the leaves is distilled the beautiful, green, aromatic, camphorate, essential oil called by the Malays at Amboyna, where it is chiefly made, *Cajuputi*, from *Cajuputi* one of the Malay names of the tree.

When this tree was received into the Botanic garden, and for the first five or six years afterwards, I was inclined to think it *Arbor alba major. Rumph. Amb.* ii. *t.* 16. on account of its very rapid growth during that period; as well as because it was then very generally understood, that the essential oil *Cajuputi* was obtained from that tree. But for these last six or seven years, the growth (of several trees) has been so slow, though in perfect health, flowering and ripening abundance of fertile seed, at all seasons of the year, as to induce me to waver in my former opinion, and become rather inclined to consider it *Arbor alba minor* of the same author. This idea was encouraged by finding our trees agree, in most respects, better with Rumph's description of the latter, than with the former, and particularly because he expressly says that an essential oil is obtained by distillation from the leaves of the small sort; but makes no mention of any such oil being procured from the large species. These conjectures have received additional support, I may say confirmation, from the *Pharmacopœia* above quoted. The following is a copy of Dr. Powell, the translator's note, on this subject. III. 397

"This oil was supposed to be the produce of the *Melaleuca Leucadendron*, but it appears from the specimens of the tree yielding the true *Cajuputi*, sent home by Mr. Christopher Smith, that the species is different, and referable to *tab.* 17 of Rumphius's *Herbarium Amboinense*, (*vol.* xi.) and not to that author's *Arbor alba, tab.* 16. After a careful examination of specimens in Sir Joseph Banks', and other collections, by Dr. Maton, and of those in the *Linnæan Herbarium* by Dr. Smith, we are authorized to consider the tree which yields the above oil, as a new species, and from the names of its medicinal product, those gentlemen have agreed to give it the appellation of *Melaleuca Cajuputi.*"

As there are two figures in the 17th table of Rumphius, Dr. Powell should have specified which of the two is meant, but I take it for granted that it is the 1st.

2. M. *Leucadendron. Willd.* iii. 1428. *Smith in Trans. of Linn. Soc.* iii. 274.

Leaves alternate, vertical, lanceolate-falcate, five-nerved, tender parts smooth.

Arbor alba. *Rumph. Amb.* ii. *t.* 16.

This species was only introduced into the Botanic garden in 1811, whereas M. *Cajuputi* has been there since 1797-8. The plants of the former are still small, nor can they be expected to blossom for some few years to come, their growth is scarcely so rapid as that of *Cajuputi*; in habit, plants of the same age are very much alike, but the leaves of this species are larger, more falcate, and possess little or no fragrance when bruised, nor can I discover that they are ever employed in the distillation of the *Cajuputi* oil; to those obvious marks of distinction in the young tree I may add that all the most tender shoots, leaves, &c. are here perfectly smooth while in *Cajuputi* they are sericeous. III. 398

3. M. *viridiflora. Gært. Sem.* i. 173. *Smith. in Trans. of Linn. Soc.* iii. *p.* 275. *Willd.* iii. 1429.

Page Carey Ed.

Branchlets erect. *Leaves* alternate, lanceolar, five-nerved. *Spikes* terminal, downy. *Flowers* tern.

4. M. *Leucadendron. B. Linn. Suppl.* 342.

A large tree, a native of Pulo Pinang, and the peninsula of Molucca. The leaves of the trees which grow in those places are when preserved in the specimens sent to me, void of fragrance.

Leaves alternate, short-petioled, lanceolar, entire, five-nerved, with many delicate, anostomosing veins between them, of a firm rigid texture, and smooth on both sides, from two to four inches long, and less than one broad. *Stipules* none. *Spikes* terminal and axillary, often compound, tufted, before the flowers expand imbricated with bractes, a little downy. *Bractes* oblong, sessile, three-flowered; the extreme ones barren, and from their centre the branchlets continue to shoot. *Flowers* numerous, small. *Calyx* above, five-parted; *divisions* of the border rounded, and deciduous. *Petals* sessile, round, concave scarcely larger than the division of the calyx. *Filaments* from thirty to fifty, united near the base into five erect bodies. *Anthers* small, incumbent, oval, two-lobed. *Germ* round, hid in the calyx. *Style* as long as the stamens. *Stigma* simple. *Capsules* hid in the globular calyx, which it adheres to, three-celled, three-valved, somewhat downy. *Seeds* numerous, minute, clavate, angular, somewhat winged.

III. 399

5. M. *rigida. Roxb.*

Leaves alternate, approximate, sessile, linear-lanceolate, rigid, pungent-mucronate, nerveless, but slightly striated, spikes panicled. *Flowers* tern.

A native of the Molucca Islands. To what size it grows I cannot say.

Leaves approximate, scattered, sessile, straight, linear-lanceolate, rigid, very smooth nevertheless, but slightly striated lengthways, sharp pungent-pointed, about three fourths of an inch long, by one line in breadth. *Spikes* terminal, cylindric, five or six of them forming the panicle, ending in a small bud, which in due time protrudes a branchlet beyond them, and by the time the seeds are ripe, the capsules are lateral. They are tasteless. *Calyx* smooth, border of five large, rounded segments. *Petals* five, sub-sessile, round. *Filaments* about twenty-five, much longer than the corol, united at the base into five bodies. *Germ* smooth. *Style* rather shorter than the stamens. *Stigma* simple.

DURIO. Schreb. gen. N. 1221.

Calyx gibbous, five-toothed. *Corol* five or six-petalled. *Stamina* in five bodies. *Style* single. *Pome* superior, five-celled.

D. *Zibethinus. Willd.* iii. 1434. *König in Trans. of Linn. Soc.* vii. *p.* 266.

Durio. *Rumph. Amb.* i. *t.* 29.

A native of the Malay Islands. The fleshy aril which envelopes the seed of this large fruit, like that of the Jack, is the part eaten; but not so universally admired, for its strong, by some thought very offensive, smell.

HYPERICUM. Schreb. gen. N. 1224.

III. 400

Calyx five-leaved. *Petals* five. *Filaments* many, conjoined into five sets.

1. H. *cernuum. Roxb.*

Shrubby, branchlets drooping. *Leaves* sessile, broad-lanceolate. *Flowers* terminal, subsolitary. *Styles* five.

Asiat. Res. vi. *p.* 369.

A native of the mountains between Hurdwar and Shreenagur, from thence the seeds were sent by Captain Hardwicke, to the Botanic garden in 1797, where it blossoms during the cold season. It resembles, in many respects, the species described under the name H. *monogynum.*

Stems, or rather *branches* numerous from the same root, rising in every direction, soon dividing into numerous long, slender, round, smooth, coloured, drooping twigs. *Bark* brown, and smooth, height of the whole plant about three feet, and still more in diameter. *Leaves* opposite, sessile, decussate, broad-lanceolate, obtuse, somewhat nervous, entire, margins not revolute, smooth, of a lively green on both sides, from one to two inches long. *Flowers* terminal, at the ends of the long, pendulous branchlets, generally solitary, though sometimes two or even three-fold, large, of a pure yellow. *Peduncles* short, with two small, brown, caducous bractes near the middle. *Calyx* five-leaved; *leaflets* lanceolate, acute. *Petals* obliquely-oblong, four times longer than the calyx. *Filaments* numerous, from one to two hundred, coalesced into five bodies, just at the base only, and about half the length of the petals. *Germ* ovate. *Styles* five, the length of the stamens.

This is so nearly allied to the plant I have taken for H. *monogynum*, No. 977, that I could scarcely deem them distinct species, were it not for the difference in the number of stamina and styles. In *monogynum* there are about fifty of the former only, and uniformly a single style with a five-cleft apex.

2. H. *monogynum. Willd.* iii. 1442.

III. 401

Shrubby. *Leaves* sessile, linear-oblong. *Corymbs* terminal. *Stamina* the length of the petals. *Style* single. *Stigma* five-cleft.

H. *aureum. Lourier. Cochin Ch.* 578.

Chin. Keemsee-jau-taing.

H. *monogynum. Miller's Figures, t.* 151. *f.* 2. *Curt. Bot. Mag. N.* 334.

A low, but ramous shrub, growing in the Company's Botanic garden, originally from China. In flower and seed great part of the year.

Stem none, but branches innumerable. *Bark* pretty smooth, brown. *Leaves* approximate, opposite, decussate, sessile, and nearly stem-clasping, horizontal, linear-oblong, obtuse, entire, smooth on both sides; from one to two inches long. *Stipules* none. *Flowers* terminal, from one to so many as form a small umbel, short-peduncled, large, of a bright yellow. *Calyx* five-leaved; *leaflets* smooth, oblong, green. *Petals* five, obliquely wedge-formed as in the monodelphous flowers. *Filaments* from thirty to fifty, in five phalanges, nearly as long as the petals. *Anthers* oval, incumbent. *Style* single, as if composed of five, being five-grooved, as long as the stamens. *Stigma* five-cleft. *Capsules* five-partible, five-celled, opening from the apex. *Seeds* many. Page Carey Ed.

CLASS XIX. III. 402

SYNGENESIA AEQUALIS.

SONCHUS. Schreb. gen. N. 1233.

Receptacle naked. *Calyx* imbricated, gibbous. *Pappus* hairy, sessile.

1. S. *orixensis. Roxb.*

Annual. *Flowers* sub-umbelled; *peduncles* hairy, calyces woolly. *Leaves* lanceolate, and sagittate, stem-clasping, lobes rounded, margins scolloped, finely-toothed, smooth.

Beng. Bun-palung.

Teling. Nalla-tapata.

A rare plant, a native of rubbish, &c. near Samulkota. It flowers during the latter part of the cold season.

Stem annual, erect, from three to six feet high, as thick as the fore finger, somewhat branchy, piped, round, smooth, except near the top, where there are a few hairs with glandular extremities. *Leaves* approximate, stem-clasping; the lower ones linear, or lanceolate, scolloped, the upper ones sagittate, all are finally prickle-toothletted, both sides smooth; *size* very various. *Flowers* numerous, large, yellow, terminal, umbelliforum, calyces involved in a little soft woolly substance. Cattle are fond of every part of the plant, on being wounded there is much milky juice discharged, which thickens into a substance like fresh soft *opium.*

2. S. *oleraceus. Willd.* iii. 1514. III. 403

Annual. *Flowers* sub-umbelled; *peduncles* and *calyces* smooth. *Leaves* pinnatifid, and sagittate, stem-clasping, finely-toothed.

Compare with *Prenanthes sonchifolia. Willd.* iii. 1541.

Teling. Eatrinta.

This species is much more common than the last described, it delights in the same soil. It flowers during the same season, is also annual, branchy, and about the same size.

Leaves approximate, stem-clasping, much enlarged at the base, the lower ones pinnatifid, the upper ones sagittate; all are prickle-toothed, both sides smooth; size various. *Flowers* as in the last described species. Cattle are fond of it and it yields a milky juice on being wounded.

LACTUCA. Schreb. gen. N. 1234.

Calyx imbricated, cylindric, with a membranaceous margin. *Receptacle* naked. *Seeds* even, with a simple stipitate pappus.

L. *sativa. Willd.* iii. 1523.

Leaves rounded, cauline leaves cordate. *Stem* corymbed.

Pers. Kahoo.

Arab. Khuss.

Native place uncertain, but it is common in gardens in India, Persia, and the neighbouring countries, and like most of the plants of this class, succeeds best during the dry season.

PRENANTHES. Schreb. gen. N. 1236.

Calyx calycled. *Florets* in a single row. *Pappus* simple, sub-sessile. *Receptacle* naked.

1. P. *acaulis. Roxb.*

Herbaceous, stemless. *Leaves* radicle, sessile, linear-lanceolar, smooth and entire. *Scape* four or five-flowered, much shorter than the leaves. *Florets* eight. III. 404

A native of the interior parts of Bengal, from the district of Dinagepore Dr. Carey sent the plant to the Botanic garden at Calcutta, where it flowers in March and April.

Root perennial. *Stem* none, the top of the root, under the surface of the soil divides into several shoots, each of which produces a single small tuft of leaves from its apex. *Leaves* radical, sessile, linear-lanceolate, entire, very smooth, of a deep green on both sides; from four to six inches long, and less than half an inch broad. *Scapes* short, in general about an inch long, smooth, bearing from one to six alternate, yellow, pedicelled flowers. *Calyx* from six to eight-leaved, with a *calycle* of three or four ovate scales.

2. P. *procumbens. Roxb.*

Procumbent. *Leaves* mostly radical, linear, runcinate. *Racemes* terminal, flowers in rather remote fascicles. *Calyces* many-flowered.

Page Carey Ed.

A native of Bengal. It flowers during the hot season.

Root simple or somewhat branched, when broken discharging an orange-coloured sap, of a heavy, soporific smell; from their size, it may be supposed they are biennial or more. *Stem* none, but many, procumbent, dichotomous, smooth branches springing immediately from the root, from one to two feet long. *Leaves* chiefly radical, spreading flat on the earth, linear-runcinate, segments short, and rather obtuse; margins a little scabrous, with minute, spinous points, those of the branches less divided and even entire. *Racemes* ascending, terminal, as long as the rest of the plant below them. *Flowers* in rather remote fascicles, yellow. *Pedicels* nearly as long as the flowers, scaly, with small bractes. *Calyx* sub-cylindric, scales linear, with white membranaceous margins, and quickly decreasing into a calycle. *Florets* from twenty to thirty. *Pappus* simple, and sessile.

3. P. *asplenifolia. Willd.* iii. 1540.

III. 405

Ascending, ramous, many-flowered. *Leaves* sessile, linear, pinnatifid, or runcinate, smooth. *Beng.* Teek-chana.

Common on the higher, cultivated, and uncultivated lands of Bengal. Flowering time the cold season. The same plant is also common on the sand hills near the sea along the Coromandel coast.

Root simple, biennial, if not perennial. *Stems* at the base stoloniferous, short, variously bent, dichotomous, smooth, many-flowered. *Leaves* mostly radical, and spreading flat on the ground, sub-sessile, pinnatifid, smooth; from two to three inches long. *Flowers* pretty large, of a bright yellow. *Calyx* the exterior leaflets small as if a calycle.

4. P. *racemosa. Roxb.*

Annual, ramous. *Leaves* runcinate, stem-clasping, finely-toothed. *Flowers* racemed, and in fascicles. *Peduncles*, and *pedicels* smooth.

A native of the coast of Coromandel, where it is found during the dry season, on road sides, and among rubbish.

Leaves approximate, stem-clasping, the lower ones runcinate, the superior ones cordate-sagittate, all are smooth, and finely prickle-toothed, size various. *Racemes* terminal, long, slender, jointed; *joints* remote, bracted, flower-bearing. *Flowers* small, yellow, placed at the joints of the racemes only. *Calyx* calycled, cylindric, scales of the tube about eight, those round its base many, small, and extending half way down the pedicels. Cattle are fond of it and it is replete with the same kind of milky juice, common to these plants.

SERRATULA. Schreb. gen. N. 1264.

Receptacle naked. *Calyx* sub-cylindric, imbricated; *scales* pointed, but not hooked nor spinous. *Pappus* hairy.

1. S. *anthelmintica. R.*

III. 406

Annual. *Leaves* broad-lanceolar, serrate. *Flowers* terminal, calyx squarrose. *Pappus* of hairy bristles.

Vernonia *anthelmintica. Willd.* iii. 1634.

Cottu-shiragom. *Rheed. Mal.* ii. *t.* 24.

Sans. Somraj.

Beng. Somraj.

Conyza *anthelmintica. Linn.*

Teling. Shendoo-gella-kura.

Is a pretty large, erect, annual species, common on high dry uncultivated ground, and rubbish. It flowers during the cold season.

Stem erect, branchy, round, clouded with elevated purple spots, slightly downy, from two to three feet high. *Leaves* scattered, petioled, broad-lanceolate, grossly serrate, slightly downy, running down to the insertion of the petioles, size very various. *Flowers* terminal, peduncled. *Calyx; leaflets* unequal, the exterior ones small, subulate, diverging; the interior ones wedge-formed. *Florets* twenty or thirty, equal, all hermaphrodite. *Tube* curved; *segments* of the border five, incurved. *Style* long, two-cleft. *Seeds* cylindric, crowned with hairs, or rather hairy soft bristles. *Receptacle* naked.

2. S. *cinerea. Roxb.*

III. 407

Erect, annual. *Leaves* alternate, ovate-cordate, crenate, rugose. *Flowers* terminal, somewhat fastigiate; *pappus* hairy.

Conyza *cinerea. Willd.* iii. 1925.

Beng. Kookseem.

This plant is one of the most common in every part of India; every soil and situation suits it, and it is in flower at all times of the year.

Root ramous, annual. *Stem* erect, ramous, round, a little downy and finely furrowed. *Leaves* alternate, petioled, ovate, and ovate-cordate, crenate, rugose, often waved, somewhat pubescent, decurrent to the base of the petioles, from one to three inches long. *Flowers* terminal, numerous, sub-fastigiate, small, purple coloured. *Florets* equal, all hermaphrodite. *Calyx* imbricate, with narrow-lanceolate acute downy scales. *Seeds* cylindric, white, hairy; *pappus* hairy.

The florets being constantly uniform, and all hermaphrodite, induce me to consider it a *Serratula* rather than a *Conyza.*

Note. A variety from China, has the flowers much larger and nearly round. The seeds are smooth, and only about half the number of rays in the pappus.

3. S. *carthamoides. Buch.*

Annual, erect, simple. *Leaves* sub-sessile, (not decurrent,) pinnatifid, serrate, hoary un-

derneath. *Flowers* terminal, sub-panicled. *Calyx* ovate, with the lower scales carinated. Page Carey Ed.

A native of Nepal; from thence Dr. Buchanan sent the seed to the Botanic garden at Calcutta in 1802, where the plants blossom, and ripen their seed from November till March.

Stem annual, erect, simple, slightly striated, and somewhat scabrous, height of the plants in the Botanic garden, from two to three feet. *Leaves* alternate, sub-sessile, not decurrent, pinnatifid, serrate, with the exterior segment ovate-lanceolate, and acute, the lateral ones linear-oblong and obtuse, pretty smooth above and hoary underneath; from two to four inches long. *Flowers* terminal, pedicelled, sub-panicled, small, of a rose-colour. *Calyx* ovate; *scales* numerous, imbricated, acute, the exterior ones have a sharp keel on the back. *Florets* all hermaphrodite; *pappus* plumose, sessile, many times longer than the seeds.

CARDUUS. Schreb. gen. N. 1254.

Calyx ovate, imbricated with thorny scales. *Receptacle* hairy.

1. C. *ramosus. Roxb.*

Annual, dichotomous. *Leaves* sessile, lanceolate, thorny, toothed, downy underneath. *Flowers* solitary, terminal. *Stigmas* hid within the anthers, and bearded at the base. III. 408

This is rather a rare plant, growing on dry, cultivated lands after the crop is cut, during the cold season.

Root annual, simple, perpendicular. *Stem* short, flexuose, striated, ramous. *Branches* two-forked, like the stem; the whole plant from one to two feet high. *Leaves* scattered, sessile, not decurrent, lance-lyrate, thorny. *Flowers* terminal, peduncled, of a pale purple. *Florets*, from twenty to thirty. *Style* shorter than the stamens. *Stigmas* two, hid within the anthers, erect, bearded at their base.

2. C. *radicans. Roxb.*

Annual, diffuse, rooting; the branches with rather sharp angles. *Leaves* sessile, cuneate, remotely but deeply serrate, smooth. *Flowers* terminal, solitary, spines of the calyx long, slender, inoffensive; *receptacle* chaffy.

A native of Mysore, where it grows on dry fields, from thence the seeds were sent by Dr. Buchanan to the Botanic garden, where the plants thrive luxuriantly, blossom during the rains, and ripen their seed in two and three months afterwards.

Stem scarcely any, but in this rich moist soil, numerous stout branches spreading all round to a considerable extent, emitting numerous roots from every part, which strike deep into the soil when the branch rests on it; *young shoots* angular from a continuation of the nerves of the leaves. *Leaves* alternate, approximate, sessile, almost stem-clasping, cuneate, glossy, serrate-dentate, having the margins and nerves somewhat scabrous, and the apices of the serratures ending in short soft spines, with numerous darker coloured minute cells visible on viewing them between the eye and the light, from one to four inches long. *Flowers* terminal, solitary, short-peduncled, of a middling size and lively lilac colour.

3. C. *lanatus.*

Erect. *Leaves* petioled, lance-lyre-shaped, thorny-toothed, woolly underneath. *Flowers* numerous, peduncled. *Stigmas* high above the anthers. *Pappus* hairy. III. 409

Cnicus *lanatus. Willd.* iii. 1617.

A common annual, on cultivated spots in Bengal, during the cold season.

Root simple, crooked, annual. *Stem* erect, simple, or with a few spreading branches near the root, striated, round, clothed with a little wool, about two feet high. *Leaves* scattered, petioled, lyrate, or lanceolate-sinuate, with the margins much waved, toothed, the teeth armed with long sharp thorns, pale green on the upper side, covered with white wool on the under side, from three to six inches long. *Flowers* terminal, peduncled, large, pale, purple. *Florets* one hundred or more. *Anthers* half hid in the mouth of the tube. *Stigma* long, above the anthers; *sides* grooved; *apex* emarginate.

CYNARA. Schreb. gen. N. 1257.

Calyx dilated, imbricated with fleshy, emarginate scales with an acumen.

C. *Scolymus. Willd.* iii. 1691.

Perennial. *Leaves* somewhat spiny, pinnatifid. *Calycine scales* ovate.

Arab. Hirshuf.

Hind. Kungin.

Native place uncertain. Flowering time the cold season in the gardens of Hindoostan.

CARTHAMUS. Schreb. gen. N. 1261.

Calyx ovate, imbricated; *scales* thereof with foliaceous, sub-ovate apices.

C. *tinctorius. Willd.* iii. 1706.

Annual, erect, ramous. *Leaves* sessile, broad-lanceolate, serrate-aculeate.

Cnicus Indicus. *Rumph. Amb.* v. *t.* 79. III. 410

Sans. Koosumbha.

Beng. Koosum.

Cultivated in many parts of India, during the cold season, not only for the use of the dyers, but for the oil obtained for the seed.

SPILANTHUS. Schreb. gen. N. 1266.

Common calyx erect, with leaflets numerous, sub-equal, oblong, the two exterior longer,

Page Carey Ed. *Pappus* of two bristles.

1. S. *Amella. Willd.* iii. 1713.

Annual. *Leaves* opposite, petioled, ovate, serrate. *Peduncles* long, one-flowered, florets equal.

A B C daria. *Rumph. Amb.* vi. *t.* 65.

Teling. Marata-tiga.

Verbisina *Amella. Linn. Sp.* ii. 1271.

Annual, a native of shady places. It flowers during the cold season.

Stem in young plants conspicuous, and erect, in those more advanced there is not any, but several branches with their lower ends resting on the ground and rooting at the joints, with about a foot of their extremities erect, ramifications opposite, or two-forked, with very long peduncled flowers in the cleft. *Leaves* opposite, petioled, the most general form is ovate, with the anterior margins very remotely, and grossly serrate, smooth, from one to four inches long, and from three-fourths of an inch, to three inches broad. *Peduncles* solitary in the divisions of the branches. *Flowers* yellow, conical. *Calyx*, the leaflets ciliate. *Corol*, the tube of the lower florets has a bend outwards to fit the next within; border from four to five-cleft. *Seeds* of the margins three-cornered, of the centre compressed, and two-horned. *Chaff* boat-formed.

2. S. *oleracea. Willd.* iii. 1715.

III. Annual, ramous. *Leaves* oval, grossly serrate.

411 A native of Silhet. In the Botanic garden it is in flower and seed the whole year. The leaves are used as a pot-herb by the natives of that district.

BIDENS. Schreb. gen. N. 1267.

Calyx imbricated. *Corol* with sometimes a ligulate floret or two in the circumference. *Seed* crowned with straight, hispid, barbed awns. *Receptacle* chaffy.

1. B. *trifida. Buch.*

Annual, erect, smooth. *Leaves* opposite, three-parted, grossly serrate, smooth. *Flowers* solitary, peduncled; the exterior calyx twice the length of the flowers, its leaflets wedge-shaped. *Seeds* flat, cuneate, smooth, two-horned.

Found in Nepal by Dr. Buchanan, who sent the seeds to the Botanic garden, where the plants blossom during the dry season, but perish when the rains begin in June.

Stem erect, round, smooth, jointed. *Branches* opposite, and like the stem, but much shorter, height of the whole plant in the Botanic garden about one foot. *Leaves* opposite, on concave, winged petioles, simple, and three-parted; grossly serrate, smooth, the simple leaves or segments of the divided ones, nearly lanceolate, and obtuse. *Flowers* peduncled, solitary, terminal, erect. *Calyx* double, the *exterior leaflets* five, wedge-shaped, and nearly twice the length of the flower, the *inner* ones oblong, and rather shorter then the corollets. *Seeds* flat, wedge-shaped, smooth, without angles; horns two, rarely three, backwardly hispid, diverging.

Note. In Nepal Dr. Buchanan says the leaves were often bipinnate.

2. B. *bipinnata. Willd.* iii. *p.* 1725.

III. Annual. *Leaves* bipinnate, gashed and dentate-serrate. *Flowers* terminal. *Calyx* of from
412 seven to nine simple, clavate, ciliate leaflets, from two to four neuter ligulate florets in the ray. *Seeds* numerous, diverging. The exterior chaff with ciliate apices.

A native of Bengal. It flowers during the rainy and cold seasons.

CACALIA. Schreb. gen. N. 1269.

Receptacle naked. *Pappus* hairy. *Calyx* cylindric, oblong, at the base only sub-calycled.

1. C. *bicolor. R.*

Perennial, spreading. The *inferior leaves* short-petioled, remotely serrate; the *superior* ones hastate-laciniate, purple underneath.

This elegant species was received into the Botanic garden from the Moluccas in 1798, and blossoms during the cold season.

Stem scarcely any; *branches* many, spreading in every direction, smooth and coloured when in an exposed situation. *Leaves* alternate, not succulent, the inferior ones short-petioled, lanceolate, remotely serrate; the superior ones stem-clasping, hastate-laciniate, smooth on both sides, underneath of a deep purple colour, particularly when the plant grows in a situation exposed to much sun-shine. *Flowers* terminal, large, of a deep orange colour. *Peduncles* long, one-flowered, with many sub-lanceolate scales. *Calyx* calycled.

This plant is highly ornamental when well exposed to the sun, the leaves are then of a deep purple colour on the under side. It grows readily from cuttings.

2. C. *reclinata. Roxb.*

Shrubby, smooth. *Branches* reclined. *Leaves* petioled, ovate-cordate, dentate-serrate. *Flowers* terminal. *Calyx* and *calycle* of about eight leaflets each, and with about twenty florets.

III. A native of the Islands in the Straits of Malacca.

413 *Leaves* alternate, petioled, ovate-oblong, pointed, with the margins dentate-serrate, smooth on both sides and of a slender texture, from one to three inches long, and about one broad. *Petioles* short, channelled. *Flowers* terminal, somewhat umbelled, pretty large. *Calyx* about eight-leaved, nearly the length of the florets. *Calycle* about eight-leaved, many times shorter than the calyx. *Corol*; *florets* about twenty.

3. C. *sonchifolia. Willd.* iii. 1730. Page Carey Ed.
Erect, annual, fistulous. *Leaves* lyrate, and sagittate, stem-clasping. *Flowers* umbelled.
Muel-schevi. *Rheed. Mal.* x. *t.* 68.
Beng. Sadi-modi.
An erect, branchy annual, a native of hedges, rubbish, &c. it flowers during the cold season.
Stem erect, flexuose, branchy, from two to three feet high, piped, smooth. *Leaves* stem-clasping, lyred, most slightly dentate, pretty smooth. *Umbellets* terminal, compound, many-flowered. *Flowers* small, of a bright purple colour. *Calyx* simple, from eight to twelve-toothed, from eight to twelve striated. *Seed* five-seeded.

ETHULIA Schreb. gen. N. 1271.

Receptacle naked. *Pappus* a membranaceous margin. *Calyx* equal.
E. *ramosa. Roxb.*
Ramous, erect. *Leaves* alternate, elliptic, serrate, smooth. *Flowers* peduncled, sub-corymbiform.
Introduced into the Botanic garden by seeds sent from the interior of Bengal, by Dr. William Carey. Flowering time the cold season.
Root annual, fibrous. *Stem* and *branches* nearly erect; general height of the whole plant, which is considerably ramous, about two feet, smooth in every part, and somewhat succulent. *Leaves* alternate, sub-sessile, elliptic, pretty smooth on both sides, serrate, from one to three or four inches long, and not quite half so broad. *Peduncles* opposite to the leaves, axillary, or terminal, each supporting many small, purple flowers, forming a very irregular corymb. *Calyx* imbricated; *leaflets* short. *Florets* numerous, of a light purple colour. *Seeds* sub-clavate, from four to five, or six-sided. *Pappus* none. III. 414

EUPATORIUM. Schreb. gen. N. 1272.

Receptacle naked. *Pappus* plumose. *Calyx* imbricated. *Style* semibifid, erect.
1. E. *divergens. Roxb.*
Shrubby, erect. *Branches* diverging. *Leaves* alternate, ventricose-oblong, recurved, serrate-dentate, rugose. *Corymbs* terminal. *Calyx* from five to eight-flowered.
A native of Mysore, from whence Dr. Buchanan sent the seeds to the Botanic garden in 1801, where the plants blossom during the cold season.
Stem erect, straight, from six to eight feet high, shrubby, round, covered with pretty smooth, dark brown bark. *Branches* numerous from the middle of the stem upwards, round, downy, and diverging. *Leaves* alternate, short-petioled, elliptic, recurved, serrate-dentate, rugose, while young downy, when old scabrous, from one to six inches long. *Corymbs* terminal, compound, or the whole upper half of the plants may be called one large panicle. *Flowers* very numerous, several together and sub-sessile, on short villous peduncles. *Calyx* sub-cylindric, imbricated, downy. *Florets* five or six, twice as long as the calyx, curved near the middle of the tube; at first purple, gradually becoming white, mouth of the tube campanulate; *segments* of the border narrow, sub-ensiform. *Stamens* and *style* erect. *Pappus* almost simple, twice as long as the calyx. *Receptacle* concave. III. 415
Note. In 1810 found a plant with ten or twelve florets in the calyx.
2. E. *flexuosum. Willd.* iii. 1761.
Shrubby, erect. *Leaves* alternate, short-petioled, broad-lanceolate, remotely and grossly serrate, triple-nerved. *Corymbs* terminal.
A native of Flat Island near the Mauritius, where it was found by Colonel Hardwicke, in flower in May, who observes that the leaves are covered with a viscid juice and are used for green wounds as we use court plaster. The fresh flowers are highly aromatic, and the honey of Bourbon is strongly impregnated with the same flavour.
3. E. *asperum. R.*
Perennial, erect, harsh with short stiff hairs. *Leaves* alternate, sessile, cuneate-oblong, serrate. *Flowers* terminal, few but large. *Calyx* somewhat woolly, from twenty to thirty-flowered.
A native of Bengal, and like most of the order, flowers and ripens its seed during the dry season.

AGERATUM. Schreb. gen. N. 1273.

Receptacle naked. *Pappus* five-awned. *Calyx* oblong, sub-equal. *Florets* four or five-cleft.
1. A. *cordifolium. Roxb.*
Leaves opposite, cordate, serrate, hairy. *Flowers* sub-umbelled. *Florets* five-cleft.
Beng. Oochunti.
An annual found in the vicinity of Calcutta during the rainy and cold seasons; flowering time the cold season.
Stems erect, round, a little hairy. *Branches* opposite; height of the whole plant about two feet. *Leaves* opposite, petioled, cordate, serrate, hairy; size very various, the larger four or five inches long. *Flowers* very numerous, rather small, of a pale purple, terminating the plant in numerous, sub-globular umbellets, the whole forming a large, irregular, compound corymb. *Calyx* [illegible] *Seeds* black, with hispid angles. *Pappus* of five III. 416

Page Carey Ed. scales, with broader, cordate, serrate bases, ending in long subulate points, resembling the partial calyx of the orders *Polygamia Segregata. Receptacle* naked, hemispheric.

2. A. *aquaticum. Roxb.*

Annual. *Leaves* opposite, lanceolate, serrate. *Flowers* sub-umbelled. *Stigma* clubbed, twice the length of the florets.

Beng. Bura kesutee.

A native of the borders of rivulets among the Circar mountains. Flowering time the cold season.

Stem annual, somewhat succulent, below resting on the ground, above erect, round, very slightly hairy, from two to four feet long. *Leaves* opposite, decussated, petioled, horizontal, broad-lanceolate, serrate, smooth, somewhat succulent; from four to six inches long. *Flowers* terminal, forming an irregular, thin umbel, white. *Calyx* from twenty to thirty-leaved, equal. *Corol*, outside of the mouth woolly. *Stamens* within the tube. *Stigmas* twice as long as the corollets, erect, clubbed, white, they are a good and conspicuous mark. *Seeds* crowned with a glandular margin, from which issue three, four or five headed, pedicelled glands. *Receptacle* naked.

Note. By the structure of the stigmas, they being when full grown, far above the anthers, and the flowers all erect, it might be concluded the pollen could not reach them, but I could observe clearly that the anthers are ripe, and burst while the stigmas are of an equal length with and closely embraced by them, the stigmas continue to grow and carry with them a large portion of the dust; this wonderful economy I have frequently observed in a number of plants which at least helps to invalidate one of the old anti-sexualists' argumeuts.

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ATHANASIA. Schreb. gen. N. 1279.

Calyx imbricated. *Pappus* chaffy, very short. *Receptacle* chaffy.

1. A. *Indica. Roxb.*

Annual, straight, angular. *Leaves* alternate, sessile, lanceolar, serrate, smooth. *Corymbs* compound, terminal. *Stigmas* hid within the stamens.

Teling. Begati-Kunda.

Delights in high lands that have been lately in cultivation; in such situation it is not uncommon to see whole fields of it as thick as if they were sown by a careful farmer.

Stem annual, erect, angled from the insertion of the leaves, piped, smooth, from two to four feet high. *Leaves* sessile, lanceolar, serrate, smooth. *Corymbs* very large, decompound. *Flowers* pretty large, very numerous, of a purplish rose colour. *Florets* equal, generally five. *Style* shorter than the stamens. *Chaff* of the seeds, or *pappus* lanceolate; that of the receptacle linear lanceolate.

SYNGENESIA SUPERFLUA.

ARTIMISIA. Schreb. gen. N. 1281.

Receptacle sub-villous, or nearly naked. *Pappus* none. *Calyx* imbricated with rounded, converging scales. *Florets* of the ray none.

1. A. *Moluccana. R.*

Shrubby, erect. *Leaves* multifid, smooth; *segments* filiform. *Flowers* globular, pedicelled, drooping. *Female florets* from six to eight in the circumference, two or three-toothed, with about as many five-toothed hermaphrodites in the centre.

III. 418

A native of the Molucca Islands; the branches and branchlets very numerous, smooth and drooping elegantly, with numerous minute flowers, pointing directly to the earth. *Scales* of the calyx roundish, membranaceous and smooth; the *receptacle* of the florets convex and naked.

2. A. *paniculata. Roxb.*

Shrubby, erect. *Leaves* from bipinnate to simple; *leaflets* linear, and often gashed. *Panicle* terminal, loose. *Flowers* long-pedicelled, erect; *florets* twenty, all tubular and five-toothed, about half of them are hermaphrodite; *receptacle* conical, naked.

The native place of this plant I cannot well ascertain. It was introduced into the Botanic garden from the interior parts of Bengal, and in three years it has only attained to the height of one or two feet, and is a very slender, sub-erect, flaccid, thinly branched, under shrub. Flowering time February.

Leaves alternate, petioled, from simple to pinnate, and bipinnatifid, being less divided towards the top, till they become simple amongst the flowers. *Leaflets* linear, often pinnatifid, or toothed, somewhat hoary, as are also the young shoots. *Panicle* terminal, composed of slender, alternate, sub-erect, leafy racemes. *Flowers* numerous, erect, small, sub-globular, yellow, generally one, rarely two or three, on slender, filiform, axillary pedicels. *Calyx; leaflets* unequal, oblong, concave, villous. *Corollets* twenty or more; about half hermaphrodite in the centre, the other half female in the circumference; all are tubular with a five-cleft border. In the hermaphrodite ones the segments are recurved; in the female ones incurved. *Stigmas* very large, somewhat laciniate, and truncated. *Receptacle* conical, naked.

III. 419

The smell of the plant is somewhat like that of *southern-wood*, but less powerful.

3. A. *Indica. Willd.* iii. 1846.

Herbaceous, erect. *Leaves* pinnatifid, villous underneath. *Panicles* terminal, flowers drooping, female florets ten, obliquely truncated, the hermaphrodite ones ten, with gibbous tubes;

receptacle naked. Page Carey Ed.

Sans. Dona, or Dana.

Hind. Gund-mar.

Beng. Dona.

Pers. Arlemasaya.

Is common in the gardens of the Hindoos throughout India. Flowering time the cold season.

Root ramous, perennial. *Stems* several, erect, sub-ligneous, sometimes biennial; base ramous, striated; tender parts villous; from four to eight feet high. *Leaves* alternate, pinnatifid, pretty smooth above, a little downy underneath, but not woolly and white as in A. *vulgaris*; *lobes* lanceolate, somewhat gashed, though generally entire. *Floral leaves* entire, and linear-lanceolate. *Panicles* terminal, with the ramifications and flowers all drooping. *Flowers* small, globular, numerous. *Hermaphrodite florets* about ten in the centre, five-cleft, with stamens hid in the gibbous tube. *Female* ones about the same number in the circumference, obliquely truncated, and so small as to be with difficulty distinguished from the style. *Receptacle* naked, convex.

The leaves possess a slightly aromatic smell and bitterish taste, similar to those of the common *Mugwort* which it resembles in habit, though not in the white woolly covering of the under side of the leaves nor in the inflorescence. The Hindoos employ it medicinally, and also in their religious ceremonies.

A. *vulgaris* is also a native of India, and common in gardens about Calcutta, where it is known to the Hindoos by the name *Nagadana*, which is also its Sanscrit appellation. It must also, I imagine, be a native of Japan, and China, as the one I have now described, (A. *indica*,) III. has not any of that soft white down on the under side of its leaves, of which the *moxa* is made 420 in those countries.'

4. A. *vulgaris. Willd.* iii. 1845.

Herbaceous, erect. *Leaves* pinnatifid, flat, gashed, tomentose underneath. *Racemes* simple, recurved. *Flowers* erect; ray five-flowered.

Naga or Naga dona, or Dona, its Sanscrit names, which are also its vulgar Hindoostanee, and Bengalee names. Found common in gardens in Bengal, where it flowers and ripens its seed during the dry season.

5. A. *parviflora. Buch.*

Herbaceous, with horizontal, slender branches. *Tender parts* hoary. *Leaves* simple, inferior, cuneate, with a dentate apex and some linear stipuliform segments at the base. *Flowers* ovate, drooping. *Hermaphrodite florets* about eight in the centre. *Female* ones three-toothed, and more numerous in the ray. *Receptacle* naked.

A native of Nepal, from thence the seeds were sent to this garden by Dr. Buchanan, where the plants blossom in May.

Root perennial. *Stem* ascending in an oblique direction. *Branches* many, spreading or drooping, very slender and slightly pubescent. *Branchlets* numerous, short, diverging, flower-bearing. *Leaves* sessile, wedge-shaped, with linear, stipuliform segments from the base, the inferior ones with a rounded, lobate-dentate apex; the superior ones with a three or five-cleft apex; those of the floral branchlets most minute and entire. *Flowers* numerous, pedicelled, very minute, ovate, drooping, green. *Calyx* of a few, large, (for the size of the flowers) oval leaflets. *Florets* from six to ten; *hermaphrodite* ones five-cleft in the centre, and more minute, obscurely three-toothed. *Female* ones in the ray. *Receptacle* convex, naked. The whole plant inodorous. III.

6. A. *elegans. Roxb.* 421

Annual, erect, very ramous, smooth. *Leaves* of the young plants many-parted, of the old ones nearly simple, and fasicled, all are filiform, and smooth. *Racemes* panicled. *Flowers* globular, pedicelled, nodding. *Female florets* twelve in the ray, five-cleft.

This elegant plant was sometime ago received from General Martin at Lucknow, under the name *Abbuttna*, and is now, October, in full blossom in the Botanic garden; many have also been reared from seed sent by the same gentleman.

Stem while young straight, becoming less so by age and then woody. *Branches* numerous, expanding, with their extremities often nodding; whole height from three to six feet. *Leaves* on the stem of young plants multifid with the divisions filiform, and smooth; on old plants and flower-bearing branchlets fascicled, filiform, undivided, perfectly smooth, and very small, being only about a quarter or half an inch long, and as fine as a horse hair. *Flowers* numerous, pedicelled, small, yellow, round; the whole extremities of the branches forming elegant, nodding panicles, with the flowers pointing to the earth. *Calyx* of several roundish, smooth, concave scales. *Florets*, about twelve hermaphrodite ones in the disk, and nearly as many, small, five-cleft females in the circumference. *Style* in the hermaphrodite ones shorter than the florets, with a two-lobed, funnel-shaped *stigma* in the females longer than the florets, with the stigma two-cleft, and revolute.

The leaves, when bruised, emit a faint pleasant odour. The plant, particularly when young, is uncommonly elegant when in blossom, being then straight, with numerous spreading branches, the extremities thereof forming large, very ramous, nodding panicles, loaded with numerous, beautiful, most minute, drooping flowers. III.

7. A. *carnifolia. Buch.* 422

Annual, erect, with simple, floriferous branches. *Leaves* decompound, smooth on both sides; *leaflets* ensiform. *Flowers* globose, drooping, both hermaphrodite and female florets numerous, the latter with gibbous, three-toothed corollets. *Receptacle* hemispheric, smooth.

Page Carey Ed.

A native of Nepal, from thence introduced by Dr. Buchanan into this garden, where the plants thrive well and blossom in March and April.

Stems erect, striated, smooth. *Branches* axillary, simple, reclined, floriferous; height of the whole plant rather under one foot. *Leaves*, the caulinc decompound, or more, smooth on both sides, ultimate divisions ensiform, those of the branches from pinnatifid or pinnate to simple. *Flowers* solitary in the axill of the leaves of the branches, slender, peduncled, drooping, hemispheric, of a pale greenish yellow, the size of a grain of black pepper. *Calyx, leaflets* from oval to oblong, with broad, white, membranous margins. *Florets; hermaphrodite* numerous in the centre; *female* numerous in the circumference, with gibbous three-toothed margin. *Receptacle* hemispheric, smooth.

8. A. *madraspatana. Willd.*

Annual, procumbent. *Leaves* sessile, pinnatifid, downy; *peduncles* one-flowered. *Female florets* three-toothed.

Nelam-pata. *Rheed. Mal.* x. *t.* 49.

A native of dry lands that have been lately in cultivation. It flowers during the cold season.

Richard's description of this plant is so good, that I have only to add, that the seeds have a small, ciliate, campaniform crown.

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9. A. *hemispherica. R.*

Annual, erect, ramous. *Leaves* pinnate; *leaflets* some sub-linear and others pinnatifid. *Flowers* solitary, peduncled, hemispheric. *Hermaphrodite florets* four-toothed; the *female* ones naked.

A small, erect, ramous annual, of short duration, appearing in dried up rice fields about Calcutta during the months of February and March.

Root of many, small, simple fibres. *Stem* erect, towards the apex ramous, round, smooth, except for a few, soft, woolly fibres; the whole height from six to eight inches. *Leaves* alternate, pinnate, nearly as long as the stem of the plant. *Leaflets* alternate, linear, toothed, gashed or pinnatifid. *Floral leaves* small and nearly simple. *Flowers* terminal, hemispheric, solitary, peduncled, with generally a small leaf about the middle of the peduncle, in the flowering time erect, afterwards bent to one side, drooping. *Calyx*, exterior leaflets largest. *Hermaphrodite florets* four-toothed, numerous in the centre; the *female* ones naked and more numerous in the circumference. *Receptacle*, the seeds from the hermaphrodite florets leave hollow pits thereon, whereas those of the female, leave sub-columnar elevations.

10. A. *sternutatoria. R.*

Annual, procumbent, woolly. *Leaves* sessile, wedge-shaped, dentate, downy underneath. *Flowers* axillary, sessile; *hermaphrodite florets* from ten to twelve, four-cleft; the *female* ones numerous, three-toothed. *Receptacle* naked.

Beng. Mechitta, also Nukh chiknee.

Appears with other syngeneseous plants during the latter part of the cold season, on cultivated land. The whole plant does not cover more than about six or eight inches in diameter,

III. 424

and is the smallest of the genus I have yet met with in India.

Root simple. *Stems* several, branchy, pressing on the earth; all are somewhat woolly. *Leaves* numerous, sessile, wedge-shaped, deeply dentate, villous. *Flowers* axillary or in the divisions of the branches, solitary, sessile, sub-globular. *Hermaphrodite florets* from ten to twelve in the centre, with their border four-toothed, coloured, and expanding; the *female* ones very numerous in the circumference, most minute, with the border seemingly three-toothed, and the toothlets incurved. *Receptacle* naked.

It differs from A. *minima* in having sessile, downy leaves, and numerous flosculi in each flower. The minute seeds are used as a sternutatory by the Hindoos. I have often used them successfully myself.

GNAPHALIUM. Schreb. gen. N. 1282.

Receptacle naked. *Pappus* feathery (or simple.) *Calyx* imbricated, marginal scales rounded, scariose, coloured.

1. G. *strictum. Roxb.*

Stem straight, annual. *Leaves* alternate, sessile, linear, wedge-shaped, downy. *Spikes* compound, sub-panicled. *Florets* yellow, with white woolly calyx.

A small, annual species, growing in dry shady places during the cold season, where water has stood during the rains.

Stem straight, in a favourable soil, branchy, round, covered with soft, whitish down, about a foot long. *Leaves* sessile, linear, wedge-formed, or lanceolate, downy; size very various. *Spikes* glomerate, terminal, and from the superior axills. *Florets* very small, the florets yel-

III. 425

low, surrounded with the white, woolly, linear, acute scales of the calyx. *Receptacle* concave.

2. G. *orixensis. Roxb.*

Annual, erect, simple. *Leaves* sessile, linear, wedge-shaped, downy. *Flowers* in sessile and peduncled heads. *Florets* yellow, with woolly calyx.

3. C. *multicaule. Willd. Sp. Pl.* iii. 1888.

Is a native of similar places with the former, also annual, and flowers during the same season.

Stem and *leaves* like those of G. *strictum. Flowers* also similar, but collected in several, small, terminal umbellets, or heads, which is the only specific difference.

4. G. *depressum. Roxb.*

Annual, procumbent. *Radical leaves* wedge-shaped; *cauline* ones sub-opposite. *Head* terminal, involved in white wool, and involucred. *Florets* yellow. Page Carey Ed.

A very minute, prostrate annual; a native of the bottom of dried up ponds, in exposed situations.

Stem none. *Branches* many, prostrate, filiform, three or four inches long. *Leaves* few, sub-sessile, wedge-formed or lanceolate, woolly. *Flowers* exceedingly minute, collected in many, glomerate, terminal heads, surrounded with white, very woolly, leafy involucres. *Florets* yellow. *Female* numerous in the circumference; *hermaphrodite* from four to five in the centre.

5. G. *albo-luteum. R.*

Annual, ramous, sub-erect, woolly. *Leaves* half stem-clasping, woolly on both sides; the *inferior* ones sword-shaped. *Flowers* conglomerated.

A native of Boutan, and the banks of rivers issuing from that country. Flowering time the beginning of the hot season.

Stem ascending in a winding direction, with few or no branches, round and clothed with white, soft wool; whole height about one foot. *Leaves* half stem-clasping, the inferior ones wedge-shaped, and obtuse, above they are linear, or tapering to a point; all are covered with white down, particularly underneath, from one to two inches long. *Flowers* numerous, minute, yellow, collected on terminal fascicles, closely impacted together, the whole forming a tolerably regular corymb. *Calyx* woolly, chiefly the inferior parts. *Hermaphrodite florets* about four in the centre, with numerous three-toothed females in the circumference. *Pappus* from five to eight, simple hairs. *Receptacles* flat, naked. III. 426

CONYZA. Schreb. gen. N. 1286.

Receptacle naked. *Pappus* simple. *Calyx* imbricated, oblong. *Florets* of the ray female, and three-cleft.

1. C. *corymbosa. R.*

Shrubby. *Leaves* sub-sessile, obovate, serrulate. *Corymbs* compound. *Hermaphrodite florets* three; the *female* ones numerous in the ray.

A native of the Delta of the Ganges. Flowering time the end of the cold season.

Stem short, woody, erect, with numerous, ligneous, permanent, spreading branches; *bark* pretty smooth. *Leaves* alternate, sub-sessile, obovate, remotely and acutely serrulate, pretty smooth on both sides; from one to two inches long. *Corymbs* terminal, compound, dense, a little hairy. *Flowers* sub-cylindric, individually sessile. *Bractes* ovate, inserted round the apices of the common sub-divisions of the corymbs, and pressing on the calyx like a calycle. *Calyx* hairy. *Hermaphrodite florets* generally three in the centre, with numerous, three-toothed females in the circumference.

2. C. *pubigera. Willd.* iii. 1921.

Shrubby, sub-scandent. *Tender parts* downy. *Leaves* short-petioled, oblong, somewhat repand-dentate. *Flowers* terminal, on short, axillary, diverging branchlets.

Sonchus volubilis. *Rumph. Amb.* v. *t.* 103. *f.* 2. bad if intended for this plant, which is a native of the Moluccas.

3. C. *balsamifera. Willd.* iii. 1924. III. 427

Shrubby, erect, *Leaves* lanceolate, unequally serrate, tomentose, at the base pinnatifid. *Corymbs* terminal; *flowers* sub-cylindric.

C. *odorata. Rumph. Amb.* vi. *t.* 24. *f.* 1. pretty good.

A native of the eastern parts of Bengal, from thence introduced into the Botanic garden at Calcutta, by Dr. Buchanan, where it grows to be a large shrub, with an erect, ligneous trunk, and branches covered with ash-coloured bark. Flowering time March and April.

Leaves alternate, short-petioled, lanceolate, irregularly serrate and generally more or less pinnatifid at the base, downy, particularly underneath, where they are sericeous and beautifully reticulated with numerous veins; from six to twelve inches long. *Petioles* short, often ornamented with one, two, three, or four, small leaflets. *Corymbs* terminal, numerous, bearing numerous, sub-cylindric, bright yellow flowers. *Hermaphrodite florets* numerous in the centre, the *female* ones numerous in the circumference.

The whole plant when bruised smells strongly of camphire.

4. C. *laciniata Roxb.*

Annual, erect, ramous. *Leaves* downy, variously laciniated, with the margins curled, and acutely gash-toothletted. *Panicles* terminal; *flowers* conical.

A native of Bengal, where it appears and ripens its seeds during the cold season.

Root annual. *Stem* erect, ramous, particularly near the top, striated, villous. *Branches* expanding, height of the whole plant from two to five feet. *Leaves* alternate, sessile, downy on both sides, variously laciniate or pinnatifid, with the margins curled, acutely gash-toothletted and often ciliate, the floral ones, from two inches long, the lower or radical ones, six or eight inches long. *Panicles* terminal, erect. *Flowers* pedicelled, very numerous, yellow, conical. *Receptacle* convex. III. 428

It differs from *lacera*, in having all the leaves laciniate and from *terebinthinacea* in the inflorescence and flowers. In this the panicle is expanded, and oval, and the flowers conical, in that corymbiform, and the flowers ovate.

5. C. *lacera. Burm. Ind.* 180. *t.* 59. *f.* 1.

Annual, erect. *Leaves* oval, sharp-toothed, downy. *Flowers* sub-umbelled.

Beng. Bura kooksoong.

In a large ramous annual species, a native of dry pasture ground near hedges. Flower-

Page Carey Ed. ing during the cold season.

Stem erect, branchy, particularly near the ground. *Leaves* the lower, or rather the principal leaves of the stem are petioled, lyred; the superior ones simply oval, and many times smaller; all are sharp-toothed, pale green, downy, various in size. *Umbellets* terminal, and from the exterior axills peduncled. *Flowers* a dull yellow.

The whole plant has a pretty strong smell of turpentine.

6. C. *aurita. Willd.* iii. 1929.

Annual, erect, ramous, covered with glutinous down. *Leaves* oblong, somewhat lyred, finely-toothed, downy. *Peduncles* terminal, bracted, one-flowered.

This species is also annual, a native of the same places with the former, flowering in the same season.

Stem erect, about two feet high, very ramous, round, covered with glutinous down. *Leaves*, the *inferior* ones large, petioled, oval, slightly lyred; the *superior* ones small, linear, sessile, runcinate; all are finely-toothletted, and covered with very soft, somewhat glutinous down; size very various. *Peduncles* terminal, bracted, downy, erect, one-flowered, the whole forming something like a large flattened panicle.

This species smells still stronger of turpentine than the last described, at the same time the smell is far from being disagreeable. These two promise to contain active principles, yet I cannot learn that they have ever been employed for any use. Cattle never taste either of them.

III. 429 7. C. *diffusa. R.*

Annual, erect, lower branches long, spreading, or drooping, downy. *Inferior* leaves sublyrate; *superior*, sessile, oblong, serrate-dentate. *Flowers* terminal.

A native of Bengal, where it appears during the dry season.

8. C. *fistulosa. Roxb.*

Annual, erect, fistulose, downy. *Leaves* sub-sessile, lanceolate, sinuous-toothed. *Spikes* sub-verticelled.

Annual, a native of dry ground near the mountainous parts of the coast. It flowers during the cold season.

Stem erect, from two to three feet high, piped, branchy, striated, downy. *Leaves* subsessile, broad-lanceolate, a little hairy, the lower ones sinuous-toothed; the *superior* ones irregularly toothed; size various. *Spikes* terminal, sub-verticelled, long, erect. *Flowers* numerous, pretty large, purple and yellow. *Female florets* numerous, minute, three-toothed. *Hermaphrodite* twenty in the centre.

9. C. *angustifolia. Roxb.*

Annual, erect. *Leaves* sessile, linear, entire, downy. *Panicles* terminal; *flowers* most numerous.

This plant is annual, and I have only met with it in the Company's Botanic garden; it does not appear to be a native of Bengal. I rather suspect the seed to have been accidentally brought in boxes of earth, with other plants from the Andamans.

Stem simple, erect, striated, somewhat scabrous, without branches till within a foot, or eighteen inches of the top, where there are several, forming a large oval panicle, the whole height of the plant from four to eight feet. *Leaves* alternate, sessile; those of the stem most remotely serrate, and reflected; those of the branches entire; all are linear-lanceolate, or linearly-clavate, and covered with short hairs; size very various. In the axills there are always several small leaves. *Flowers* most numerous, small, of a very pale yellow. *Panicles*, the whole top, or ramous part of the plant forms a single, large, diffuse one, of an oval form. *Calyx* hairy. *Hermaphrodite florets* about ten, or twelve, in the centre. The *female* ones numerous, in the circumference they are very minute and have the ligulate border three-toothed.

III. 430

It is from a plant of this genus, or a *Baccharis*, Dr. Buchanan informed me that the natives of the Andaman Islands make their twine for fishing lines; and as the bark of this is strong, and peels off in long stripes, it may be the same.

10. C. *bifoliata. Willd.* iii. 1920.

Herbaceous, ascending, downy. *Radical leaves* short-petioled, the cauline ones sessile, all are serrated, dentate, and downy. *Peduncles* long, one-flowered, often with one or more leaf-like bractes near the middle.

An annual, a native of dry land, about hedges and road sides. It flowers during the cold season.

Stems or *branches* several, ascending, from nine to twenty-four inches high, round, downy. *Leaves*, the inferior ones large, short-petioled; the upper ones small, sessile, all are obovate-oblong, downy, serrate, serratures acute. *Flowers* many, terminal, long-peduncled, yellow. *Peduncles* filiform, straight, often leaf-bearing near the middle, the number in any plant is uncertain, but generally more than two. *Scales* of the calyx linear, hairy.

11. C. *pinnatifida. Buch.*

Shrubby, erect. *Leaves* from pinnatifid, and bipinnatifid on the stem, to linear, and nearly simple, amongst the flowers, soft and villous. *Corymbs* terminal, compound. *Flowers* oval, with about five hermaphrodite florets in the centre, and many female ones in the ray, all fertile.

A native of Nepal. It flowers in the cold season in the Botanic garden.

III. 431 12. C. *alata. R.*

Shrubby; ramifications numerous and winged. *Leaves* linear-lanceolate, entire, decurrent. *Peduncles* terminal, becoming axillary, often winged, and then with a leaf near the solitary flower. *Calycine leaflets* subulate, the exterior ones recurved.

Found in Nepal by Dr. Buchanan, who sent the seeds to the Botanic garden where the plants blossom during the hot season. Page Carey Ed.

13. C. *repanda. R.*

Annual, straight, ramous. *Leaves* stem-clasping, not decurrent, lanceolar, repand-denticulate. *Flowers* numerous, on the branchlets ovate.

From Pegu introduced into the Botanic garden where it appears about the close of the rains, flowering and ripening its seed from December till May.

Root annual. *Stem* straight to the top of the plant, from three to six feet high, slightly striated, and somewhat pubescent. *Branches* numerous, alternate, nearly erect, with alternate, simple or decompound, floriferous branchlets. *Leaves* alternate, stem-clasping, but not decurrent; those of the stem large, broad-lanceolate, tapering most toward the base, where they expand into two lobes, one on each side of the stem; the *margins* repand, and dentate, from six to ten inches long. Those of the branches and branchlets very small; all are harsh to the feel, and a little hairy. *Flowers* ovate, small, yellow, in little, rather remote, alternate fascicles, on the branchlets, some sessile, some short-peduncled. *Scales* of the *calyx* linear, with scariose, ciliate margins. *Corollets* from ten to twenty, five-toothed hermaphrodite in the centre, numerous, and most slender, three-toothed females in the circumference. *Pappus* of simple white hairs. *Receptacle* flat, dotted.

14. C. *salicifolia. Willd.* iii. 1939.

Shrubby. *Leaves* linear-lanceolar, entire, downy underneath. *Corymbs* terminal, densely ramous. *Flowers* with one hermaphrodite floret in the centre, and many most slender females in the ray. III. 432

A native of the Mauritius, where it blossoms in September.

15. C. *lanceolaria. R.*

Perennial, erect, from four to six feet high. *Leaves* lanceolar, serrate, smooth; *petioles* sub-pinnatifid-winged, but not decurrent. *Flowers* panicled, sub-ovate.

Furmol, the vernacular name in Silhet, where it is indigenous and an article of the Materia Medica of that district. It flowers during the months of February and March, and the seed ripens in about two months.

ERIGERON. Schreb. gen. N. 1287.

Receptacle naked. *Pappus* hairy. *Florets* of the *ray* female, ligulate, and very narrow.

E. *asteroides. Roxb.*

Annual, hairy, and glutinous. *Branches* longer than the stem. *Leaves* oblong, gashed; downy. *Flowers* a few, terminal, peduncled; *florets* of the *ray* numerous, long and slender.

An annual, a native of dry cultivated lands. It flowers during the cold season.

Stem erect, from six to twelve inches high, ramous near the ground, round, hairy. *Branches* ascending, longer than the stem. *Leaves* alternate; the *inferior* ones short-petioled, oval or obovate, grossly-toothed; the *superior* ones sessile, oblong, sub-lyred; all are covered with soft down, and are somewhat glutinous. *Flowers* a few, terminal, peduncled, large, flat. *Hermaphrodite florets* of the disk yellow; the *female* ones ligulate; those of the border blue, generally entire, and only emarginate.

SENECIO. Schreb. gen. N. 1290. III 433

Calyx cylindrical, calycled, apices dead. *Receptacle* naked. *Pappus* simple. *Florets* of the disk male, of the ray female.

S. *Moluccana. R.*

Shrubby, erect. *Leaves* sessile, from cuneiform to elliptic, very remotely serrate-dentate. *Corymbs* terminal. *Corols* naked.

A native of the Molucca Islands.

ASTER. Schreb. gen. N. 1291.

Receptacle naked. *Pappus* simple. *Florets* of the ray ligulate and more than ten. *Calyx* imbricated; lower scales spreading.

1. A. *chinensis. Willd.* iii. 2038.

Annual, hairy. *Leaves* sub-oval, deeply serrate, or gashed, and ciliate with winged, stem-clasping petioles. *Flowers* terminal, solitary.

A. chenopodii folio, &c. *Dill. Elth. t.* 34. *f.* 38.

From Nepal, where it is indigenous, Dr. Buchanan sent the seed to the Botanic garden at Calcutta, under the name *Gagaatus*, which is its vernacular one in that country.

2. A. *trinervius. Roxb.*

Shrubby, scandent. *Leaves* sessile, entire, and serrate, three-nerved. *Panicle* terminal, thin.

A native of Nepal, from thence Dr. Buchanan sent the seeds to the Botanic garden, where the plant blossomed in November and December, when about two years old.

This handsome, shrubby species does not seem to require any further description than the above. The original plant did not produce ripe seed, and perished when three years old. III. 434

DORONICUM. Schreb. gen. N. 1297.

Receptacle naked. *Calyx* imbricated. *Seeds* of the disk with a simple, hairy pappus; those

Page Carey Ed. of the ray naked.

D. *calcaratum. R.*

Annual, erect, ramous, and slender. *Leaves* stem-clasping, sagittate, serrate.

Jacobea perfolia. *Burm. Zeyl. t.* 55. *f.* 2.

Inula *Indica. Willd.* iii. 2092.

Teling. Paleroopoo.

An annual, growing under the shade of trees, on an uncultivated dry soil. It flowers during the cold season.

Stem erect, ramous, round, coloured, a little hairy; from one to three feet high. *Leaves* stem-clasping, sagittate, irregularly serrate, somewhat downy. *Flowers* many, terminal, peduncled, pretty large, yellow. *Florets; female* of the ray tongued, linear, three-toothed, in the fissures of the mouth of the tube there stands a filiform recurved spur opposite to the tongue. This is an excellent specific mark. *Seeds* of the female florets, naked, smooth; those of the hermaphrodites hairy, and crowned with hairy pappus. *Receptacle* convex, naked.

TAGETES. Schreb. gen. N. 1302.

Receptacle naked. *Pappus* of five, erect awns. *Calyx* one-leaved, five-toothed. *Florets* of the ray four or five, permanent.

1. T. *patula. Willd.* iii. 2126.

Annual, ramous, spreading. *Leaves* lanceolate, ciliate-serrate.

Pers. Gool Jafree.

III. 435 *Beng.* Genda.

2. T. *erecta. Willd.* iii. 2127.

Annual, erect, ramous. *Leaves* lanceolate, ciliate-serrate. *Peduncles* naked, one-flowered.

Beng. Genda.

If originally from Mexico, like *Tobacco*, they have now become denizens of the East, and considered as indigenous, particularly in Persia and China. They blossom during the coolest season in the Botanic garden at Calcutta.

ZINNIA. Schreb. gen. N. 1304.

Receptacle chaffy. *Pappus* of two straight awns. *Calyx* sub-ovate, imbricate.

Z. *bidens. Retz. Obs.* v. 28.

Leaves pinnatifid. *Flowers* peduncled, hermaphrodite; *florets* four-cleft.

Is a rare plant on the coast of Coromandel, I have only found it amongst the Circar mountains during the rainy season, when it flowers.

Root woody, perennial. *Stem* erect, frequently ramous, and from six to eighteen inches high. *Leaves* radical, many, petioled, pinnatifid, smooth; *divisions* linear, those of the stem sub-sessile, otherwise they are like those of the root. *Flowers* a few, terminal, peduncled, small, yellow. *Calyx* simple, from eight to ten-leaved. *Hermaphrodite florets* of the *disk* from seven to twelve, four-cleft. *Female florets* of the *ray* from five to ten. *Stamens* four. *Seeds*, those of the ray shortest, all compressed, striated, and two-horned; *horns* straight, divaricate, acute, armed with short, stiff hairs pointing backwards, by these they adhere readily to whatever touches them.

III. 436 *Note.* Willdenow has by some unaccountable mistake quoted Retzius's Z. *bidens*, which I know to be this plant, as I was with König when he first discovered and described it, for *Verbesina Boswellia*, a very ramous, cespitose plant; whereas this is rigidly erect.

CHRYSANTHEMUM. Schreb. gen. N. 1307.

Receptacle naked. *Pappus* none. *Calyx* hemispherical, imbricated; the marginal scales membranaceous.

1. C. *Indicum. Willd.* iii. 2147.

Diffuse, perennial. *Leaves* variously divided. All the florets ligulate.

Tsjetti pu. *Rheed. Mal.* x. *t.* 44.

Matricaria Chinensis. *Rumph. Amb.* v. *t.* 91. *f.* 1. bad.

Teling. Chamunti.

Common in gardens all over India, where one name, Gool-daoodi of the Hindoos, serves for all the varieties. Flowering time the cold season.

2. C. *cuneatum. R.*

Perennial, diffuse, or creeping. *Leaves* sessile, wedge-shaped, deeply serrate, or gashed round the anterior margins. *Flowers* solitary, whitish; *scales* of the *calyx* cuneate, and ciliate.

A native of the Moluccas.

PYRETHRUM. Schreb.

Receptacle naked. *Pappus* emarginate. *Calyx* hemispheric, imbricate. *Scales* rather acute, with scariose margins.

P. *Indicum. R.*

Annual, erect, ramous, glaucous. *Leaves* stem-clasping, pinnatifid. *Branches* one-flowered; *flowers* yellow, sometimes radiate.

Page Carey Ed. III. 437

A native of Bengal. In the Botanic garden it appears, flowers, ripens its seed, and perishes during the dry season.

Root annual, ramous. *Stem* short, furnishing numerous, approximate, erect branches, particularly near the base, which are at first simple, but as the plants advance, they furnish a branchlet from the axill of each leaf; all are round, smooth, and glaucous; general height of the whole plant from one to two feet. *Leaves* alternate, one under each branch and branchlet, linear, stem-clasping, bipinnatifid, and pinnatifid; *segments* sometimes obtuse, others trifflingly acute, from one to three inches long. *Flowers* large, of a lively yellow, solitary, on long terminal, round, glaucous, smooth peduncles. *Calyx; scales* oblong, imbricated; *margins* scariose. *Corol.* it is in general entirely composed of numerous, hermaphrodite, tubular, five-cleft florets; more rarely radiate with ligulate, three-toothed females. *Seeds* with a margin round the apex, which often projects inward like a hornlet. *Receptacle* convex, naked, dotted.

MATRICARIA. Schreb. gen. N. 1308.

Calyx hemispherical, imbricated; *marginal scales* solid. *Receptacle* naked. *Pappus* none.

M. *suaveolens. Willd.* iii. 2161.

Annual, erect, ramous. *Leaves* super-decompound, filiform; *ray* white; *disk* yellow. *Receptacle* conical.

A native of Hindoostan, and Persia. Flowering time the cold season in the Botanic garden.

COTULA. Schreb. gen. N. 1310.

Receptacle almost naked. *Pappus* marginate. *Florets* of the disk four-cleft; of the ray, scarcely any.

C. *sinapifolia. Buch.*

Annual, sub-erect. *Leaves* alternate, petioled, pinnatifid, or lyrate, serrate, hairy. *Flowers* floscular, small, sub-terminal, peduncled. III.

A native of Nepal, from whence Dr. Buchanan sent the seeds to the Botanic garden at Calcutta, where the plants blossom in May. 438

Stem nearly erect, a little hairy, succulent, with few ascending branches; height of our plants at Calcutta, from six to twelve inches. *Leaves* alternate, petioled, pinnatifid, serrate, rugose, a little hairy, and harsh to the feel. *Flowers* peduncled, terminal, several together, small, globular, in the centre yellow, in the ray silver-coloured. *Calyx* from twelve to sixteen-leaved. *Florets* of the centre hermaphrodite, yellow, four-cleft; those of the ray female, more numerous, white, smaller, and two or three-toothed. *Receptacle* hemispheric, naked. *Seeds* crowned with a callous margin, and often with two small, tender bristles.

ECLIPTA. Schreb. gen. N. 1316.

Receptacle chaffy. *Pappus* none. *Florets* of the *disk* hermaphrodite and four-cleft; those of the ray female, and ligulate.

E. *prostrata. Willd.* iii. 2218.

Annual, scabrous, from erect, to prostate. *Leaves* opposite, sub-sessile, lanceolate, serrate. *Peduncles* axillary, one, two, or three together, one-flowered. *Seeds* scabrous.

Ecliptica. *Rumph. Amb.* vi. *t.* 18. *f.* 2.

Beng. Kesuti, or Keysuria.

Cajenneam. *Rheed. Mal.* x. *t.* 41. tolerable for a young luxuriant plant.

Eupatoriophalacron, &c. *Dill. Elth. t.* 113. *f.* 137, 138.

Verbesina *prostrata,* and *alba. Sp. Pl.* 1272. and I suspect E. *erecta, punctata,* and *prostrata,* are only one and the same species, or at most but accidental varieties, from age, soil, and situation; at least I have never found any other in India to compare with them.

Very common in India, and in blossom all the year, which is uncommon in this class. III.

In tattooing, the natives after puncturing the skin, rub the juicy green leaves of this plant over the part; which gives the desired indelible colour, viz. a deep bluish black. 439

SIEGESBECKIA. Schreb. gen. N. 1320.

Receptacle chaffy. *Pappus* none; *exterior calyx* five-leaved.

1. S. *orientalis. Willd.* iii. 2219.

Annual, erect; *branches* dichotomous or trichotomous. *Leaves* opposite, from triangularly ovate, to lanceolate, the larger obtusely laciniate. *Peduncles* from the fork of the branches, one-flowered.

A native of the Moluccas.

This has the inversely pyramidal, tubercled, brown, bald seed of Gærtner's plant, which induces me to think it is his, though the leaves do not agree.

2. S. *brachiata. Roxb.*

Annual, erect, brachiate, ultimately dichotomous. *Leaves* opposite, petioled, triangularly cordate, grossly serrate. *Calyx* longer than the florets.

An annual, a native of the moist vallies among the Circar mountains. Flowering time the cold season.

Stem erect, round, piped, branchy, downy. *Branches* cross-armed, stem-like; the whole height about four feet. *Leaves* opposite, petioled, cordate, coarsely serrate, running down the

Page Carey Ed. petiole, very soft, downy; the longer ones are from four to five inches long, and three broad. *Flowers* terminal, small, yellow. *Leaflets* of the common exterior calyx, wedge-formed, increasing in length till the seeds are ripe; on the outside they have simple hairs; and on the inside they end in green glutinous bulbs. *Hermaphrodite florets* ten, shorter than the calyx; five of which stand in the disk; the other five stand alternate with the five female florets in the ray.

III. 440 There is no other interior calyx than the obtuse, boat-like chaff of the receptacle; their number is equal to that of the female florets which they embrace, they are covered on the outside with hairs, each ending in a green glutinous bulb.

VERBESINA. Schreb. gen. N. 1317.

Receptacle chaffy. *Pappus* awned, or none. *Calyx* simple, or in a double order.

1. V. *calendulacea. Willd.* iii. 2226.

Perennial, creeping. *Leaves* opposite, broad-lanceolate, serrate. *Peduncles* very long, one-flowered. *Calyx* five-leaved. *Female florets* eleven.

Beng. Bangra.

Pee-cajoni. *Rheed. Mal.* x. *t.* 42.

Caltha, &c. *Burm. Zeyl. t.* 22. *f.* 1.

Grows amongst bushes or wet lands near Calcutta. Flowering during the rains.

Stems annual, creeping, or climbing; *branchlets* sub-erect, round, somewhat scabrous, from one to four feet long. *Leaves* opposite, sessile, broad-lanceolate, sometimes most slightly and remotely serrate, on both sides scattered with short, stiff, white hairs issuing from dark green pits, from two to four inches long. *Peduncles* axillary, solitary, longer than the leaves, erect, round, a little hairy, one-flowered. *Flowers* pretty large, of a bright yellow. *Calyx* five-leaved. *Hermaphrodite florets* from twenty to thirty. *Female* ones from ten to fifteen, with their apices three-toothed. *Seeds* angular, crowned with a variously divided coronet. *Receptacles* convex, chaffy; *chaff* lanceolate.

The plant is void of smell, but has a slight terebinthenaceous taste.

III. 441 2. V. *biflora. Willd.* iii. 2226.

Erect, annual. *Leaves* opposite, petioled, ovate-lanceolate, serrate. *Flowers* terminal, three-fold; the middle one often sessile. *Calyx* many-leaved.

Vallia-manga-mari. *Rheed. Mal.* x. *t.* 40.

A native of various parts of India. It flowers in the cold season.

3. V. *scandens. Roxb.*

Perennial, scandent. *Leaves* opposite, petioled, cordate, serrate, three-nerved. *Flowers* terminal, tern, and solitary. *Calyx* double. *Female florets* eight.

Beng. Bim-raj.

Is perennial, a native of hedges, uncultivated places, &c. about Calcutta. It flowers during the rainy and cold seasons.

Stem long, straggling, or climbing, often as thick as the little finger, smooth. *Branches* opposite, somewhat four-sided. *Leaves* opposite, petioled, cordate, serrate, pointed, three-nerved, a little hairy, particularly the nerves, from two to four inches long. *Petioles* channelled, half the length of the leaves. *Peduncles* terminal, generally three-fold, erect, the lateral ones three-flowered, white, that of the centre has only one. *Flowers* pretty large, of a bright yellow. *Florets*, about twenty *hermaphrodite* ones, and eight or ten *female* ones with their apices two or three-toothed. *Seeds* turbinate, angular, scabrous. *Receptacle* chaffy, a little convex; the *chaff* wedge-formed, concave, hairy.

This plant, like the last, has no smell; but tastes slightly terebinthaceous.

4. V. *sativa. Roxb.*

Annual, erect, hispid. *Leaves* opposite, stem-clasping, cordate-lanceolate, serrate. *Flowers* terminal, long-peduncled, two or three-fold.

Karamdoo of the inhabitants of the Mysore country, where the plant is cultivated in
III. 442 the fields for its seed, from which an oil is expressed, and used as a substitute for the common sesamum oil. It is also cultivated in the vicinity of Nagpore, and in various other parts of India, for the same purpose. In 1800, the seeds were received into the Botanic garden from H. Colebrooke, Esq. the resident at the Court of the Berar Raja, and from Mr. Heyne at Bangalore.

The usual season for cultivating this plant, is during the cool months, between October and March.

Stem annual, erect, round, harsh, with white, slender, curved bristles. *Branches* opposite, expanding; the height of the whole plant, in a good soil, about three feet; the parts exposed to the sun tinged with purple. *Leaves* opposite, stem-clasping, linear-lanceolate, with cordate, almost perfoliate bases, remotely serrate, somewhat harsh but not so much so as the stem and branches; from four to six inches long, and from one to two broad at the base. *Peduncles* terminal, generally two or three together, though sometimes solitary, one-flowered, round, hairy; from three to six inches long. *Flowers* large, beautiful, of a bright lively yellow, inodorous. *Calyx* common, simple, five-leaved; *leaflets* ovate, villous. *Hermaphrodite florets* numerous in the centre, five-toothed. *Female florets* about eight or ten in the circumference, broad tongue-shaped, three-toothed. *Seeds* of both the hermaphrodite and female florets smooth, dark, of a blackish brown colour, nearly four-sided, with the angles rounded and tapering to the base. *Receptacle* convex, chaffy. *Chaff* concave, one to each floret embracing the exterior side of the seed. Those of the female florets larger.

5. V. *Lavenia. Fl. Zeyl.* 310. Page Carey Ed.

Annual, erect, hairy. *Leaves* opposite, and alternate, petioled, from cordate to oblong, three-nerved, serrate, hairy. *Seeds* of the disk two-horned, those of the ray three.

Lavenia erecta. Willd. iii. 1724.

Pu-tumba. *Rheed. Mal.* x. *t.* 63. a bad figure, and that of *Burman's Zeyl. t.* 42. is still worse.

An annual, a native of dry rubbish, and lands that have lately been in cultivation. It flowers most part of the year. III.

Stem erect, round, hispid, branchy; the whole plant two or three feet high. *Branches* 443
below opposite, above often alternate, or two-forked. *Leaves* short-petioled, opposite or alternate with the branches, in young luxuriant plants cordate, in others oblong, or broad-lanceolate, pointed, three-nerved, serrate, scabrous and downy; size very various. *Peduncles* solitary, leaf-opposed or in the divisions of the branches, round, scabrous, one-flowered. *Flowers* small, white. *Calyx* common, simple, five-leaved. *Hermaphrodite florets* from ten to fifteen in the disk; and five female ones in the ray. *Seeds* of the ray three-horned, and three-sided; those of the disk compressed and two-horned. *Chaff* of the *receptacle* linear; *apex* from three to four-toothed.

This has a faint, pleasant, aromatic smell.

6. V. *Boswellia. Willd.* iii. 2225.

Annual, cespitose. *Leaves* alternate, and divided into numerous capillary segments.

A native of Coromandel, where it appears on low sandy moist ground during the dry season.

Willdenow considers *Zinnia, bidens* (*Retz. Obs.* vi. 28.) to be this plant. It is very different, and according to my idea, a very perfect *Zinnia*, with a herbaceous, rigidly erect stem, and pinnatifid leaves; whereas this lies flat on the ground, and leaves bi- and tripinnate.

SYNGENESIA FRUSTRANEA.

HELIANTHUS. Schreb. gen. N. 1322.

Calyx imbricate, somewhat squarrose. *Pappus* two-leaved. *Receptacle* chaffy, flat.

H. *annuus. Willd.* iii. 2237.

All the leaves cordate, three-nerved. *Peduncles* thickening. *Flowers* drooping. III.

Beng. Soorja mookee. 444

Pers. Gooli-aftab.

Of this we have several varieties from China, and Persia, and although originally from Peru, it may now without much impropriety, be inserted here, as an Indian plant.

CENTAUREA. Schreb. gen. N. 1331.

Calyx imbricate. *Florets* of the ray funnel-formed, longer and irregular. *Receptacle* bristly. *Pappus* simple.

1. C. *moschata. Willd.* iii. 2278.

Calyx with roundish-ovate, smooth scale. *Leaves* lyrate-toothed.

Hind. Shah-pusund.

In gardens all over India, where it flowers during the cold season, and is considered a native of Persia.

2. C. *lanata. Roxb.*

Annual, ramous, woolly. The *interior leaves* petioled and sub-pinnatifid; the *superior* ones, sessile, lanceolar. *Scales* of the *calyx* with scariose pectinate margins.

Found by Richard Pierard, Esq. on a mountain in the vicinity of Hurdwar. From the specimens collected by that gentleman, seeds were obtained which produced abundance of plants in this garden which blossomed in April and May.

Stem erect, soon dividing into many, alternate, sub-erect, somewhat angular, woolly branches; the whole height from twelve to eighteen inches. *Leaves* numerous, approximate, the inferior ones petioled and pinnatifid; the superior ones sessile, lanceolar and linear-oblong, about the middle of the plant they are remotely denticulate, while those near the flowers are entire, all are woolly on both surfaces; from two to six inches long. *Peduncles* terminal, solitary, short, one-flowered; size and colour of the flowers nearly as in C. *cyanus*. *Scales* of III.
the calyx oblong, with a broad, scariose, pectinate border round the anterior margins. *Neuter* 445
florets from eight to ten, with a filiform, long, curved tube. *Seeds* oblong, smooth. *Pappus* bristly in the circumference, chaffy in the centre. *Receptacle* bristly.

SYNGENESIA SEGREGATA.

ELEPHANTOPUS. Schreb. gen. N. 1347.

Partial perianth four-flowered. *Florets* tubular, hermaphrodite. *Receptacle* naked. *Pappus* bristly.

E. *scaber. Willd.* iii. 2389.

Leaves chiefly radical, sessile, oblong, very hairy. *Heads* peduncled and sessile. *Involucre* three-leaved, many-flowered.

Page Carey Ed.

Ana schovadi. *Rheed. Mal.* x. *p.* 13. *t.* 7.

Beng. Samdullum.

A native of the warmer parts of India, delighting in a dry elevated soil; flowering time the cold season.

Root fibrous, biennial or more. *Stem* erect, rigid, ramous, round, hairy, about one foot high, and as thick as a stout quill. *Leaves* chiefly radical, half stem-clasping, spreading flat on the surface of the earth, oblong, wrinkled, crenulate, very hairy. The cauline leaves are few, much smaller, and at the insertion of the branches only. *Heads* solitary, terminal on long peduncles with a sessile one at the base of each of the long peduncles. *Involucre*, or common perianth of three sessile, cordate, hairy leaflets, embracing numerous fascicles of corollets. *Perianth, partial*, many-leaved, four-flowered. *Florets* tubular; the *hermaphrodite* ones pale red. *Pappus* of five hairy bristles.

SPHÆRANTHUS. Schreb. gen. N. 1352.

III. 446

Partial perianth eight-flowered. *Florets* tubular, a few hermaphrodite ones are mixed with more obscure females. *Receptacle* scaly. *Pappus* none.

1. S. *mollis. R.*

Annual, winged. *Leaves* sessile, decurrent, long-obovate, bristle-serrate, downy and glutinous. *Peduncles* as long as the leaves; *scales* of the *perianth* lanceolate, and ciliate. *Female florets* filiform.

Adaca-manjen. *Rheed. Mal.* x. *t.* 43.

An annual, a native of dry land that has been lately in cultivation. It flowers during the cold season.

Stem scarcely any, but many expanding, dichotomous, winged branches; these wings are irregularly toothed and take their rise from the insertions of the leaves; the whole plant is from one to two feet high. *Leaves* sessile, decurrent, oblong, obtuse, bristle-serrate, covered on both sides with soft, glutinous down. *Flowers* solitary, leaf-opposed, or terminal, peduncled, globular, rose-coloured, or inclining to purple. *Peduncles* winged, branch-like. *Calyx, perianthium, common* scarcely any; *partial* one many-leaved; *leaflets* linear-lanceolate, and ciliate.

This plant is remarkably fragrant; it certainly might be applied to valuable purposes in medicine.

2. S. *Indicus. Willd.* iii. 2394.

Annual, winged. *Leaves* lanceolate, decurrent, serrate, villous. *Peduncles* short, winged; *scales* of the proper perianth cuneate, and smooth. *Female florets* about fifteen, and gibbous.

A native of Bengal, where it flowers in the cold season. This species is perfectly inodorous, whereas S. *mollis* is very fragrant.

ECHINOPS. Schreb. gen. N. 1353.

Partial perianth one-flowered. *Florets* tubular, hermaphrodite. *Receptacle* bristly. *Pappus* obscure.

III. 447

E. *echinatus. Roxb.*

Annual, ramous, spreading. *Heads* globular, spinous. *Partial perianth* double;* the *exterior* one imbricated, many-leaved; the *interior* one-leaved, five-cleft.

A native of Mysore, from thence Dr. Buchanan sent the seed to the Botanic garden at Calcutta, where the plants thrive luxuriantly, and blossom about the beginning of the hot season in February and March.

Root annual. *Stem* scarcely any, but many, dichotomous, round, villous branches spreading in every direction; height of the luxuriant plants in the Botanic garden, not more than two feet, but covering an extent of ground fully twice that in diameter. *Leaves* stem-clasping, runcinate, spinous-toothed, villous above, and tomentose, or cottony underneath. *Heads* of flowers terminal, solitary, globular, white. *Common perianth* of several, totally reflexed, spatulate, laciniate, ciliate, permanent scales. *Proper perianth* double, one-flowered; the *exterior* one of several, acute, imbricated scales, surrounded with much long hair, here and there one of the scales ending in a long, straight, simple spine, which projects a little beyond the flowers; the *inner* or *proper perianth*, one-leaved. *Tube* gibbous. *Border* five-parted; division unequal, and ciliate. *Florets, tube* cylindric; *divisions* of the border revolute. *Seeds* hairy, enclosed in the tube of the inner proper perianth. *Receptacle* globular, naked.

CESULIA. R.

Calyx common, many-leaved. *Partial perianth* one-leaved, one-flowered. *Florets* tubular, hermaphrodite. *Receptacle* naked. *Pappus* none.

C. *axillaris. Willd.* iii. 1796. *Corom. pl.* 1. *N.* 93.

Annual, creeping near the base. *Leaves* alternate, lanceolate, serrate. *Flowers* axillary, sessile.

III. 448

A native of moist places. It flowers during the wet season.

Stems annual, towards the base creeping, and branchy, above erect, round, smooth, the

* I may say triple, if the large quantity of long white hair which surrounds the many-leaved, imbricated one, can be so called.

erect parts from nine to fifteen inches high. *Leaves* alternate, stem-clasping, lanceolate, serrate, smooth, with the base much expanded, so as to form a cup-like receptacle for the flower. *Flowers* axillary, single, sessile, of a beautiful light purple. *Common perianth* many-leaved, unequal; the exterior two or three that are placed on the sides, are the largest, and end like a leaf. *Partial perianth* one-flowered, one-leaved, campanulate, smooth, contracted, margin two-cleft, permanent. *Corol* compound. *Florets* numerous, all hermaphrodite, equal; *tube* longer than the perianth; *border* five-cleft, spreading. *Filaments* five, as in the class. *Germ* ovate. *Stigma* two-cleft. *Pericarp* none, the belly of the partial perianth closely enveloping each seed, and forming its exterior covering. *Seed* one, wedge-formed, somewhat four-sided, crowned with the two divisions of the mouth of the partial perianth. Page Carey Ed.

I believe Dr. König never saw this plant, to me it seems as if it would form a new genus.

HINGTSHA. R.

Calyx, common four-leaved. *Partial perianth* one-leaved, one-flowered. *Florets* hermaphrodite, tubular, five-cleft in the disk; the *female* ones sub-ligulate, from three to four-toothed in the ray. *Receptacle* naked. *Pappus* none.

H. *repens. Roxb.*

Beng. Hingtsha.

A native of Bengal, delighting in a moist rich soil, and often extending itself considerably over the surface of the adjoining pools of water. Flowering time the cold and hot seasons.

Stems creeping, ramous, round, hairy, jointed; length very various; they appear to be perennial. *Leaves* opposite, stem-clasping, linear lanceolate, remotely serrate, a few distinct, woolly hairs over the under side of the nerve chiefly, and marked with numerous glands; from one to two inches long. *Flowers* solitary, sessile, terminal, or in the divisions of the branch-lets. *Calyx, common,* four-leaved, leaflets cordate, obtuse, the interior pair smaller, all are entire, smooth, fleshy and permanent. The *partial calyx* one-leaved, spathiform, enveloping the germ, open on the inside, where the margins overlap each other; mouth contracted, ciliate and divided. *Corol* compound, uniform, convex. *Florets* hermaphrodite, many in the disk; the female ones margin the circumference; the hermaphrodite ones funnel-shaped, five-cleft; the females sub-ligulate, the inner fissure being much deeper; *border* very short, from three to four-toothed. *Stamens* in the hermaphrodite florets five, the anthers coalesced. *Pistil* in all the germs oblong, and the stigma two-cleft. *Pericarpium* none, the calyx unchanged envelopes the oblong, smooth, black seed, which is destitute of crown or pappus. *Receptacle* flat, naked. III. 449

CLASS XX.

III. 450

GYNANDRIA MONANDRIA.

ORCHIS. Schreb. gen. N.——

Nectary horn-shaped behind the flower.

1. O. *platyphyllos. Willd.* iv. 11.

Bulbs undivided; *lip* of the nectary roundish, three-parted; *middle divisions* lanceolate, horn twice the length of the germ. *Leaves* oval, spreading close on the surface of the earth. *Racemes* erect.

2. O. *plantaginea. Corom. pl.* 1. *N.* 37.

A native of moist vallies among the Circar hills. Flowering in the rainy season.

Root a bulb, perennial, generally single, undivided, ovate, of the size of a pigeon's egg, with a few fungous, villous fibres issuing from the base of the scape near its insertion in the top of the bulb. *Leaves* from four to eight, radical, pressing on the earth, broad, oval, smooth, of a deep shining green, fleshy, slightly marked with many nerves, about four inches long, and three broad. *Scape* erect, about a foot, or a foot and a half high, including the flower-bearing part, as thick as a goose-quill, round, smooth; at every inch and a half or two inches, there is a lanceolate, foliaceous sheath. *Spike* from four to six inches long, every where surrounded with flowers. *Flowers* numerous, single-bracted, white, fragrant. *Bractes* single, one-flowered, lanceolate, nerved, as long as the germ. *Corol,* three exterior petals nearly equal; two interior, small, obliquely oblong, erect, forming a dome over the anthers. *Nectary, upper lip* short; the *under* one three-parted, middle division long, narrow-pointed, recurved. *Horn* nearly twice the length of the germ. III. 451

3. O. *commelinæfolia. R.*

Lip three-parted. *Segments* filiform; *horn* filiform, twice the length of the long taper-pointed germ; *tubers* from two to four, fusiform, thin, leafy; *leaves* lanceolate, sheathing.

An erect plant, about eighteen inches high; a native of the northern parts of Bengal, from thence introduced into the Botanic garden, where it blossoms in August, which is the middle of the rainy season.

Root consisting of two, three, or four fusiform, succulent, pale tubers, and fleshy fibres. *Stem* erect, simple, including the floriferous part, about a foot and a half round, smooth, joint-

Page Carey Ed. ed, as thick as a slender quill. *Leaves* alternate, lanceolate, shining, the largest about six inches long, by one broad, decreasing gradually into bractes in the spike, where they end, long, slender, and sharp. *Sheaths* cylindric, about half the length of the joints of the stem. *Flowers* many, scattered round the last five or six inches of the plant, pretty large, white, and inodorous. *Corol* (*calyx*, Swartz,) exterior and inferior lateral two petals semi-cordate, reflexed, ribbed; the *upper one* vaulted; the interior two unequally oblong. *Lip*, at the base a short, linear, undivided part, the rest consisting of three, nearly equal, long, filiform segments, the middle one projecting downwards and backwards, the lateral two diverging. *Horn* generally more than twice the length of the germ, filiform, with a clavate apex, green and variously curved. *Column* of the fructification short, protruding two long acute horns forward, into their fine extreme points. The proper filaments are inserted, and until expansion remain
III. hid in a very fine groove along their upper edge. *Anthers* ovate, before expansion lodged
452 between the thin folds of the column near its apex. *Stigma*, a clammy pit behind a linguiform process rising from the upper edge of the entrance into the horn. *Germ* oblong, groove long, taper-pointed.

4. O. *uniflora. R.*

Lip obcordate; the entire petals spreading; the inner two sub-rotund; *horn* filiform, three times the length of the germ. *Leaves* about two, lanceolar, three-nerved. *Peduncle* terminal, one-flowered.

A native of cool shaded moist spots amongst the Garrow hills, where it blossoms in September. The whole plant scarcely rises to six inches.

PTERYGODIUM. Swartz.

Corol five-petalled, sub-ringent; the *upper* three petals vaulted, the lower two spreading. *Lip* inserted on the style, between the cells of the anthers. *Stigma* behind.

P. *sulcata. R.*

Root, ramous, *bulbs* branchy, sub-cylindric. *Stems* leafy; the *lower leaves* ensiform. *Helmet* of the *corol* bagged behind; *lip* with a long claw and uniform lamina.

Beng. Shwet hoolee.

It is said there is a red and blue hoolee, neither of which I have yet seen. This white variety is a native of pasture ground near Calcutta; appearing during the latter part of the cold season only, about six or eight inches in height.

Roots consisting of several, pretty long, fleshy fibres. *Stem* leafy, erect, round, smooth. *Leaves* scattered, sword-shaped, with vaginated bases, entire, smooth, shorter than the stem. *Spike* oblong, crowded with numerous, small, white flowers. *Bractes* broad-lanceolate, the length of the germs. *Corol*, the three upper petals forming an helmet, of which the superior
III. one is incumbent, and formed into a bag behind. *Nectary* sub-cylindric, near the base are
453 two small, membranaceous, incurved lobes; grooved both above and underneath; the *apex* or *lamina* entire, reniform, yellow; before and after the time of blossoming it appears as if of two incurved, fleshy lobes.

EPIPACTIS. Swartz.

Corol five-petalled, spreading. *Lip* without horn. *Anther* operculate, persistent. *Pollen* granulate.

1. E. *Juliana. Roxb.*

Root a single, simple, globular, white bulb; *leaf* radical, solitary, cordate, seven-nerved. *Scape* one-flowered. *Lip* with two small falcate lobes at the base. *Lamina* rhombiform, and entire. *Capsules* six-winged.

A delicate, small plant, found in the vicinity of Calcutta amongst grass in shady places, where the soil is stiff. The flowers appear about the beginning of June, and the leaves a month or two afterwards.

Root single, biennial, round, solid clear tubers or bulbs, the size of a filbert, with here and there a short, woolly, thick fibre projecting a little from their surface. *Leaves* radical, solitary, appearing after the plant has done flowering, short-petioled, cordate, entire, smooth, from five to seven-nerved, purple underneath, about two inches long, and in breadth nearly the same. *Scape* filiform, smooth, from three to six inches long, one-flowered, partially invested in a few remote smooth sheaths. *Bractes* a single small ensiform one at the base of the germ. *Petals* five, equal, sub-unilateral, ensiform, expanding, pale green, like the scape and sheaths. *Lip* horizontal; base enlarged by a short falcate lobe on each side, which are incurved into a tube round the column; *lamina* rhombiform, entire, expanding, rather longer than the
III. petals, smooth except at the base in the inside, where there are a few hairs; colour very pale
454 pink mottled with bright red. *Germ* oblong, six-ribbed. *Column* (style) as long as the falcate wing of the lip. *Lid, pollen* and *stigma* as in the genus.

2. E. *carinata. Roxb.*

Root, a single simple, sub-globular, white bulb. *Leaf* radical, solitary, cordate, smooth, seven-nerved. *Scape* many-flowered. *Lip* rhombiform, sub-trilobate; *middle lobe* half the length of the whole, and crenate. *Capsules* oval, six-winged.

A native of Bengal; in the Botanic garden it is indigenous amongst grass, and flowers in April, the dryest and hottest month of the year, at which period the plants are destitute of leaves, but they appear in May when the flowers have withered.

Root, a single, white, sub-pellucid tuber, exactly like that of the former, (*A. juliana*) but

larger. *Leaves* radical, a single one springing from each bulb, about a month after the flowers have decayed, they are petioled, cordate, smooth, entire, of an uniform green on both sides, about seven-nerved; length and breadth rather above two inches. *Scape* erect, invested in a few simple sheaths; about six or eight inches high, and void of pubescence. *Flowers* several, peduncled, scattered round the upper part of the scape, large, drooping. *Bractes* ensiform, one under the insertion of each peduncle, and fully as long as it and the germ together, smooth. *Petals* five, equal, unilateral, linear-lanceolar, expanding, very acute, of a uniform pale green, withering. *Lip* rhombiform, at the middle on each side a deeper sinus, making the whole appear somewhat three-lobed, before these the margins are deeply and irregularly crenate, on the *inside* concave, and somewhat woolly, with purple veins, and spots on a pale greenish yellow ground. *Column* as in the genus. *Germ* oval. Page Carey Ed.

3. E. *plicata. Roxb.* III. 455

Bulb spherical. *Scape* from two to three-flowered. *Leaves* single, radical, round-cordate, plaited and coloured, many-nerved.

A small, beautiful, herbaceous plant, growing under the thick shade of bamboos, in the vicinity of Calcutta, blossoming in the months of May, and June; immediately after the flowers decay the leaf from each bulb appears.

Root, a small, solid, probably biennial, pale white, sub-diaphanous, round bulb, marked with two sets of rings, and numerous, short, obtuse papillæ, from the centre of one of the sets of the rings issues the scape, and soon afterwards the leaf. *Leaves* radical, generally single, rust-coloured on the surface, greener underneath, round-cordate, ribbed with many nerves, both sides clothed with short, distinct, white bristles, about four inches each way. *Petioles* channelled, and enveloped in sheaths like those of the scape. *Scape* radical, appearing before the leaf, erect, generally bearing on its apex two large flowers, embraced by two or three vaginated scales. *Flowers* large; *corol* of a yellowish green, with a pale rose-coloured nectary. *Calyx; spathe* a small lanceolate bracte at the insertion of each flower only. *Petals* five, equal, lanceolate, smooth, three sub-erect, and two below. *Lip* sub-cylindric, the margins towards the base, where broadest, being incurved into a tube, which conceals the column of fructification; *lamina* two-lobed. *Column* of fructification clavate, cover cordate. *Stigma* a large clammy pit in the under side, near the apex of the column.

Is propagated by suckers from the apex of the petiole, just below the leaf, and under the surface of the soil, generally two from each, and by the close of the rains, the single bulb each terminates in, is nearly as large as the parent.

4. E. *trinervia. R.*

Root creeping. *Leaves* sub-radical, petioled, ovate-oblong, three-nerved. *Scape* with about three remote sheaths below the spike. *Lamina* transversely linear.

A native of the Moluccas. III. 456

The lip and apex of the column of the fructification, are both very remarkable in this pretty plant, which is from six to twelve inches high. The latter may be compared to the bill of a sparrow, which opens when the plant is in vigorous blossom, exposing the two pedicelled polliniferous masses, hanging in a recurved direction from the apex of the upper part of the bell. The lower part, or close of the lip, linear and partly attached to the fore part of the column; the lamina linear also, but transverse, like the letter T. It has the beaked anther of Swartz's *Neottia*, and may belong to that genus.

5. E. *graminifolia. R.*

Leaves radical, linear-lanceolar, ribbed. *Scape* few-flowered. *Lip* three-lobed, with a double crest in the middle.

A small species, from about eight to nine inches in height; a native of Silhet, where it flowers during the rains. The flowers are pretty large and yellow.

MALAXIS. Swartz.

Corol five-petalled. *Lip* concave, patula ascending. *Anthers* operculate.

1. M. *plicata. R.*

Parasitic. *Leaves* in radical tufts, broad lanceolate, plaited. *Spikes* central, erect, naked. *Flowers* numerous.

It has the erect habit of *Katou-ponnam-maravara. Rheed. H. Mal.* xii. *t.* 28. which is quoted by Willdenow for his *Malaxis odorata.*

A native of Sumatra, from thence brought by Mr. Roxburgh to the Botanic garden in 1804, where it blossoms in July.

Leaves from four to five in a tuft, with their short sheathing petioles, formed into a short stalk; broad lanceolate, somewhat obliquely recurved, plaited, smooth; *margins* a little waved; about six inches long. *Spikes* from the centre of the leaves, and about their length, naked, striated, the upper half crowded with numerous, very small, greenish yellow, sessile, drooping flowers. *Bractes* solitary, one-flowered, recurved, linear-lanceolate. *Corol; petals* five, somewhat ferruginous; the upper two obliquely ovate, incumbent over the nectary, lower three subcuneate, and longer than the other two. *Labellum* greenish, inserted on the base of the column on the upper side, shorter than petals, ovate-cordate; *apex* enlarged with an obtuse point, concave and incumbent over the column, like the roof of a house. *Column* of the fructification short, sub-cylindric. *Anthers* minute, a pair being in each lobe of the lid, or cover. *Stigma* a clammy chink just below the anthers, on the upper side of the column, the situation of the nectary, and column being inverted, or resupinate. III. 457

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CYMBIDIUM. Swartz.

Corol five-petalled, erect, or spreading. *Lip* with concave base, and no horn; *lamina* spreading. *Anther* a deciduous lid. *Pollen* globular.

1. C. *amabile. R.*

Parasitic, stemless. *Leaves* radical, few, lanceolate. *Scape* naked, few-flowered, perennial, by age becoming ramous. *Lateral petals* sub-orbicular; *middle lobe* of the nectary sagittate, with two twisted recurved filaments from its apex.

Epidendrum amabile. Willd.

Angræcum album magus. *Rumph. Amb.* vi. *t.* 43.

A native of the Moluccas, and from thence introduced into the Company's Botanic garden in 1798, where it blossoms in March and April.

The flowers of this charming species are very large, pure white, and fragrant.

III. 458 The nectary is here distinctly pedicelled, besides it is rendered remarkable by the two large lateral lobes like distinct petals; and by the sagittate middle lobe being ornamented with two long tendril-like filaments from its apex.

2. C. *aloifolium. Willd.* iv. 401.

Parasitic, stemless. *Leaves* radical, linear, channelled, obliquely retuse. *Scapes* radical, nearly as long as the leaves, many-flowered. *Petals* lanceolate; *lamina* three-lobed.

Found by Mr. M. R. Smith growing on various sorts of trees on the Garrow hills, in full blossom in April.

3. C. *pendulum. Willd.* iv. 101.

Parasitic, stemless. *Leaves* radical, linear, distichous; retuse. *Racemes* radical, pendulous, longer than the leaves, many-flowered.

Epidendrum *pendulum. Corom. pl.* x. *N.* 44.

A native of the forests which cover the Circar mountains as well as of Bengal. Flowering time the hot season.

Root of many fleshy fibres, which adhere to the bark of the parent tree, stemless. *Leaves* radical, from three to five, alternate, bifarious, &c. as in the two former species, only here they are from one and a half to three feet long, and about an inch and a half broad. *Scape* radical, about two feet long, the lowermost three or four inches is involved in chaffy sheaths, the rest is the raceme, or flower-bearing part, which is perfectly pendulous, and many-flowered. *Bractes* minute, one-flowered. *Petals* lanceolate, spreading, equal, striated with red and yellow. *Lip* three-parted.

4. C. *iridifolium. R.*

Parasitic, stemless. *Leaves* bifarious, ensiform. *Spikes* filiform, drooping. *Flowers* subverticelled. *Lip* round-reniform, laciniate.

A very elegant species, found growing on trees in the forests of Silhet; it flowers during III. 459 the cold season. Here the spikes are solitary from the bosom of the exterior leaf, supported in a pretty long, two-edged peduncle. The flower-bearing part drooping and crowded in a somewhat verticelled form, with innumerable, very minute, beautiful yellow flowers; the five petals oval, and nearly equal; the lip two-lobed, roundish-reniform, with the whole of the margin deeply jagged, and the inside tomentose.

5. C. *alatum. R.*

Parasitic. *Stems* bulbiform, aggregate. *Leaf* solitary from the apex of each bulb, lanceolar. *Scapes* from the base of the bulbs, drooping, many-flowered. *Column* much incurved; *apex* winged; *lamina* two-lobed.

A middling sized species, a native of the forests of Chittagong. Flowers small, tinged with ferruginous red, and not very conspicuous, they appear in April, and May.

6. C. *nitidum. Roxb.*

Parasitic. *Stems* bulbiform, shining, with two-petioled, lanceolar, lucid leaves from the apex of each. *Raceme* axillary, the length of the leaves. *Petals* lanceolar; *lamina* three-lobed, deflected.

A native of the Garrow hills, where it is found growing on trees, and like the greatest part of this order, blossoms during the hottest time of the year, viz. May.

Root of many, hard, pack-thread-like fibres, by which it adheres to the parent trees. *Stems* none, or rather bulbiform, long ovate, shining, nearly as large as a pullet's egg, biennial. *Leaves* two, from the apex of each bulb, petioled, lanceolar, shining, about nine inches long, by one and a half broad. *Racemes* one from the apex of each bulb between the two leaves, and about their length, smooth, the upper flower-bearing, half drooping, withering. *Flowers* a few, large, nearly white. *Petals* five, nearly equal, spreading, lanceolate. *Lip* large; *lamina* deflected, three-lobed, lower lobes large, rising up, and embracing the exterior lobes, which are ovate and rather small. *Column* elongated, clavate, recurved, apex cucullate over III. the four ovate, deep yellow pollen masses. 460

7. C. *imbricatum. Roxb.*

Parasitic. *Stems* bulbiform. *Leaves* lanceolar, nerved, one from the apex of each bulb. *Spikes* solitary, from the bosom of the leaf, long-peduncled, drooping, bifariously imbricated, with one-flowered bractes.

Wellia Theka-maravara. *Rheed. Mal.* xii. *t.* 24.

A native of the forests of Chittagong and Silhet; where it is found on trees, in flower during the rains.

Root of many, slender, fleshy fibres, which fix to the bark of the parent trees. *Stems* no other than a number of oblong, fleshy bulbs, annually producing new ones from their base,

which are at first sub-cylindric, and invested in two or three short sheaths. *Leaves* lanceolar, three-nerved and somewhat plaited, smooth, of a glossy green, one, never more, from the apex of each young bulb, deciduous about the end of the first year, leaving the new full grown bulb, which perishes in the course of the second and third year, from six to eight inches long, by about two broad. *Spikes* a single, long, slender, pedicelled, cylindric one rising from the bosom or axill of each leaf, compactly imbricated on opposite sides, with numerous, oblong, smooth, one-flowered bractes, when a little advanced in size drooping. *Corol*, three exterior petals nearly equal; the interior one linear-falcate, and with the exterior upper one forming a vault over the column. *Lip* with large erect sides embracing the column, and broad, three-lobed apex pointing back to the rachis. *Column* short, with a broad, thin, concave margin. *Anthers* terminal, of a deep orange colour, two-celled. *Pollen masses* two pair, oval, waxy, of a pale yellow. *Capsules* oblong, six-ribbed, smooth, rather less than an inch long. Page Carey Ed.

8. C. *bambusifolium. R.*

Terrestrial, caulescent. *Leaves* bifarious, linear-lanceolate, much attenuated, fine-pointed. *Panicle*, or *raceme* terminal; the exterior three petals linear-lanceolate; the inner two oblong-ventricose. *Lip* length of the petals, three-lobed; the middle lobe more or less cloven. III.

Found indigenous in the forests of Chittagong, growing in well shaded places on the face of moist rocks, &c. Flowering time the hot season, March and April chiefly. 461

Stems erect, shrubby, when in flower three, four or even five feet high. *Leaves* bifarious, sheathing, linear-lanceolate, smooth, tapering from the base, and very acute, faintly from four to eight-nerved, besides the larger middle one; from six to nine inches long, and under one in breadth. *Inflorescence* terminal, sometimes a single, simple raceme, but in larger robust plants, a large panicle, composed of many, erect, spreading, simple, or compound ramifications or racemes. *Bractes* sheathing, one-flowered. *Flowers* numerous, large, rosy, with the lip of a lively red purple and very beautiful. *Petals*, the *exterior* three, linear-lanceolate; the *inner* two, oblong-ventricose. *Lip* three-lobed, with the sides or lateral lobes incurved into a tube round the column; *middle lobe* sub-rotund, and more or less cloven; *margins* elegantly curled. *Capsules* linear-oblong, six-ribbed.

9. C. *triste. Willd.* iv. 99.

Parasitic, caulescent, creeping. *Leaves* cylindric, filiform, rigid. *Flowers* forming little, short-peduncled, lateral corymbiform heads. *Lip* fleshy, with reniform cordate lamina.

Epidendrum *triste. Forst. prod. N.* 314.

A very delicate, rather small species, found on trees in the forests which cover great part of the Delta of the Ganges. In flower during the hot season.

Roots long, crooked, and rather fleshy. *Stems* ramous, creeping, slender as a quill, decaying at the base as they shoot from the apex. *Leaves* alternate, bifarious, sheathing, cylindric, long, slender, rigid, solid, variously curved, smooth, without any appearance of groove, or angle, as thick as a pack-thread, and about six inches long. *Peduncles* solitary, bursting the sheaths of the leaves, very short, few-flowered. *Flowers* small, in a little hemispheric, or corymbiform head. *Petals* linear, rather shorter than the lip, smooth, of a pale greenish yellow, the three upper ones forming a vault over the column; the lower two projecting into the margins of the lip, which is composed of an inner, oval, concave portion, joined to the lamina, or exterior reniform, cordate part; the whole is of a firm, fleshy texture, and longer than the petals; colour a dark purple, with a few yellow spots. *Anthers* deciduous; *pollen* in two round yellow waxy balls. III. 462

10. C. *aphyllum. Swartz.* See *Willd.* iv. 100.

Root fibrous. *Stems* simple, round, jointed, leafless. *Flowers* lateral, sub-sessile; *lip* with a convolute base, and sub-orbicular, undivided, fringed lamina.

Limodorum aphyllum. Corom. pl. i. *N.* 41.

A rare plant, a native of dry rocky hills. I brought it into my garden, planted it in as dry and barren a spot as I could find, but with me it lived only till the first rains fell; however, it blossomed at the beginning of the hot season.

Roots fibrous; adhering in a tuft to rocks, &c. *Stems* perennial, several, simple, diffuse, or pendulous, as the situation admits, naked, round, jointed at every inch, at each joint a small membranaceous scale, without the least vestige of a leaf. *Flowers* sessile, unless the germ is called a peduncle, generally single, issuing from the joints of the stems. *Lip* or *nectary* large, near the base the sides are incurved to form as it were, a tube; the exterior part six-parted; *margins* curled, waved, and ciliate; of a pale sulphur colour.

11. C. *tessallatum. Willd.* iv. 102.

Parasitic, caulescent. *Leaves* bifarious, equitant, linear, præmorse, dentate. *Racemes* axillary, few-flowered. *Flowers* bifarious. *Lip* with the sides incurved into a tube; *lamina* tapering, entire, acute.

Epidendrum *tessellatum. Corom. pl.* i. *N.* 42.

A very beautiful, perennial parasitic, found adhering to the trunks and branches of trees, amongst the Circar mountains. It flowers during the wet season. III.

Root, several simple, or ramous, thick, smooth, long, contorted fibres issuing from the lower naked part of the stem, as well as where clothed with the lower leaves, and adhering firmly to the bark of the tree. *Stem* perennial, simple, one or two feet long, as thick as the little finger, crooked; the *upper part* covered with leaves; the *lower* naked, withering away at the lower extremity as it extends from the apex. *Leaves* approximated, imbricate, alternate, bifarious, linear, channelled, fleshy, smooth, very firm, extremities from two to three-toothed, from six to nine inches long, and about one broad. *Racemes* axillary, solitary, naked, the length of the leaves, flower-bearing part winding, few-flowered. *Flowers* from five to ten, 463

Page Carey Ed. remote, bifarious, large, beautifully waved and striated with various shades of a greenish yellow. *Petals* oval, spreading, equal, scolloped. *Lip* the length of the petals, about the middle its sides approach, forming a tube, apex somewhat pointed.

Note. When in flower, this is a very beautiful plant; suspended in a room or elsewhere, it will continue to grow for several months, though I believe it will not flower. In this manner it, or the following species, has been brought from China to the coast, under the name of the *air*, or *Cameleon plant*, and represented as one of the most wonderful productions of nature, because it will only thrive when so suspended.

It differs from from *E. Flos acris*, in having the stem simple, and the petals oval and scolloped.

12. C. *tessaloides. R.*

Parasitic, caulescent. *Leaves* bifarious, equitant, linear, præmorse. *Racemes* lateral, longer than the leaves. *Petals* equal. *Lip* with a winged claw and fleshy lamina, which are convex and channelled above, and concave underneath; *apex* of two obtuse lobes. *Horn* conic.

III. 464 Vanda. *Asiat. Res.* iv. 302.

This beautiful plant is very common in most parts of Bengal, and found on various trees, though chiefly on the mangoe. Flowering time the rainy season.

Stem creeping, sending forth long, thick, round, ramous, fleshy, whitish roots, which fasten firmly to the trunk or branches of the tree they grow on. The plants are seldom more than two or three feet in length, for they decay at the base, as fast as they shoot from the top. *Leaves* sheathing, bifarious, approximate, recurved, linear, keeled, præmorse, five or six inches long. *Scape* generally axillary, solitary, naked, supporting from six to twelve large beautiful flowers. *Petals* five, nearly equal, expanding, oblong; *margins* waved, and here and there a little inflected; upper surface as in *E. tessallatum*, checkered with yellow and dusky ferruginous purple, underneath white. *Lip* shorter than the petals. *Horn* conical, protruding towards the germ, between the two lower petals; *lamina* oblong, turgid; *apex* two-lobed; *sides* reflex, so as to be convex above, and deeply concave underneath; in *tessallatum* incurved into a tube, and the apex acute; *colour* bluish purple or violet towards the apex; the *upper lip* or portion which forms the attachment of the lip and horn to the base of the column of the fructification, has two lateral lobes, obliquely broad-lanceolate, with their acute points incurved towards the apex of the column. *Column* of the fructification thick, short and obtuse, open in the interior margin near the apex. This mouth, or opening tapers down through the column, into a point, which ends in the belly of the germ; *operculum* sub-orbicular, with two pits for the two round polliniferous balls; when the lid of which is removed gently, the two anthers rise with a jerk in their broad cordate filaments; the lid inserted on the interior parts of the top of the column by a large infundibuliform base. If removed with less care, and before the anthers are ripe, they remain in their cells, and the funnel-shaped base of the

III. 465 filament rises erect. *Stigma* or *channel* for conveying the subtile male essence to the germ a clammy opening in the fore part of the column near its top. *Pericarpium* clavate, with six sharp ridges running the whole length.

13. C. *præmorsum. Willd.* iv. 103.

Parasitic, caulescent. *Leaves* bifarious, imbricated, linear, præmorse. *Spikes* lateral, much shorter than the leaves, many-flowered. *Petals* equal, cuneate-oblong; *lip* with erect, ovate, glandular, crisped lamina. *Capsules* cylindric.

Thalia Maravara. *Rheed. Mal.* xii. *t.* 4.

Epidendrum præmorsum. *Corom. pl.* i. *N.* 43.

Found growing on trees in the forests which cover the Circar mountains, where it blossoms during the hot season chiefly.

Root and *stem* as in the former species. *Leaves* remote, alternate, bifarious, linear, channelled, smooth, very firm, emarginate, articulated just above their sheath-like base; about six inches long, and one broad. *Spikes* between or leaf-opposed, solitary, short, straight, thick, many-flowered. *Bractes* small, triangular, one-flowered. *Flowers* surrounding every part of the spike, small, variegated with red and yellow.

LIMODORUM. Swartz.

Corol five-petalled, spreading; *lip* with base protruded into a horn; *lamina* spreading. *Anthers* terminal.

1. L. *plicatum. Roxb.*

Caulescent. *Leaves* broad, ventricose-lanceolate, cuspidate, plaited, and nerved. *Racemes* lateral, erect, simple, many-flowered. *Petals* sub-ensiform. *Lip* with a short horn, and obovate, cuspidate lamina.

Angræcum terestre primum. *Rumph. Amb.* vi. 112. *t.* 52. *f.* 1.

III. 466 A native of Sumatra. Flowering time July and August.

Stems erect, simple, short, round, jointed. *Leaves* alternate, petioled, broad-ventricose-lanceolate, cuspidate, plaited, and with as many strongly marked waves in the under side, as there are plaits. *Petioles* sheathing, and marked with a continuation of the nerves of the leaves down to their insertion, withering into bristly, annular stipules. *Scape* solitary from the joints of the stems below the leaves, and about their length, erect, simple, round, smooth, embraced by two or three remote, short sheaths. *Flowers* several, pretty large, of a mixture of yellow, green, and purple. *Bractes* solitary, one-flowered, ovate-lanceolate. *Petals* five, sub-ensiform, spreading; the inner two rather narrower: greenish on the outside; yellow on the inside and

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dotted with much purple toward the base. *Lip* obovate, cuspidate. *Horn* short and conical. *Column* of fructification as in the genus.

2. L. *bracteatum. R.*

Terrestrial, caulescent. *Leaves* bifarious, linear-lanceolate, three-nerved, raceme terminal, few-flowered. *Bractes* broad-lanceolate, large and coloured.

Found indigenous in the Garrow hills, growing in the common soil with many simple, undivided, succulent, glaucous stems, of two or three feet in height, completely invested in the sheaths of the long, narrow leaves, which are three-nerved and glaucous underneath; each stem terminating in a short, erect raceme; of three or four large white flowers, each embraced by its very large, pure white, thin, smooth bracte.

3. L. *Tankervillia. Willd.* iv. 122.

Herbaceous. *Leaves* radical, lanceolar, many nerved, and plaited. *Scape* simple, erect, many-flowered. *Lip* short-horned; *lamina* with the lateral lobes rolled in; the middle one emarginate.

A native of the hilly countries immediately north of Silhet, where it grows to be six feet high, and blossoms in April, at which period this magnificent plant is particularly beautiful. III.

4. L. *virens. Willd.* iv. 123. *Corom. pl.* i. *N.* 38. 467

Bulbs undivided, conical. *Lip* of the nectary with a short horn and two lateral inflected lobes. *Leaves* radical, linear. *Scape* branchy. *Petals* lanceolate.

Katou theka Marabara. *Rheed. Mal.* xii. *t.* 25.

Beng. Budbari.

Hind. Goruma.

A native of dry, uncultivated or pasture ground, both on the coast of Coromandel, and in Bengal; flowering in the cold season.

Root, bulbs conical, surrounded with the circular marks of the insertions of the old leaves, greenish, apices generally above the ground, many fleshy fibres issuing from the base. *Leaves* radical, several, linear, slightly nerved; nearly the length of the scape, about an inch broad, smooth. *Scape* erect, frequently branchy, from one two feet high, round, smooth, coloured with purple spots; here and there a sheathing, acute scale. *Flowers* remote, striated, of a greenish yellow. *Bractes* acute, short, one-flowered. *Petioles* nearly equal, erect or ascending. *Lip* broader, but shorter than the petals, laterally lobed; *lobes* involute; *middle division* or *lamina* large, cordate, and fringed.

5. L. *ramentaceum. Roxb.*

Terrestrial, herbaceous. *Leaves* radical, linear, three-nerved, and plaited. *Scape* simple, few-flowered. *Petals* linear, unilateral. *Lip* with a short horn and sub-trilobed, ramentaceous lamina.

A native of the northern parts of Bengal; in the Botanic garden, it blossoms in March, when destitute of leaves. Soon after the flower decays the foliage appears, and continues until November.

Root, a cluster of regular shaped, white, solid, biennial tubers. *Leaves* radical, rising in pairs within some common sheaths from the top of the recent tubers, linear, acute, three- III. nerved, plaited, smooth; from twelve to eighteen inches long, and about half or three quarters 468 of an inch broad. *Scapes* from the former year's tubes, from six to twelve inches high, round, smooth, embraced by a few ensiform scales, the upper half supporting from six to twelve pretty large, drooping, alternate, greenish pink flowers. *Pedicels* larger than the germ, slender, recurved. *Bractes* like the scales of the lower part of the scape, but small. *Petals* five, equal, linear, spreading. *Lip* united to the base of the column, three-lobed, lower half with sides or lateral lobes incurved round the column, and protruded into short conic horns behind. *Lamina*, or middle lobe spreading, sub-obcordate, margins curled and of a deeper rose colour; down the centre pale, and marked with three ramentaceous ribs. *Filaments* simple, from the interior margin of the apex of the style, just over the stigma thin; *apex* bifid. *Anthers* two, one on each division of the filament, sub-semiglobular, yellow, and of a soft, granulated, waxy consistence. *Lid* or *helmet* vertical, ovate, deciduous. *Germ* club-shaped, three-cornered, ribbed. *Style* or *column*, semi-cylindric, of the length of the lip. *Stigma* large, clammy; *pit* in the inner or flat side under the apex.

6. L. *longifolium. R.*

Terrestrial. *Leaves* from a fusiform bulb, linear, channelled, three-nerved. *Scape* erect, simple, few-flowered; *petals* equal, lanceolate. *Lip* calcarate; *lamina* three-lobed.

Kas. Tellungshor.

A native of the valleys amongst the Kasai hills; the fissures of the root spring from a slender fusiform bulb, the leaves in number about five or six, from two to three feet long, about half an inch broad, smooth and channelled; scapes radical, about one third or one fourth the length of the leaves and base, only four or five large, rosy flowers.

It differs from Thuberg's figures of *ensifolium* in the greater length and narrowness of the leaves, and three-lobed lamina of the lip. Like most of the *Orchideas*, it blossoms during the cold season.

7. L. *bicolor. R.* III. 469

Terrestrial; *bulbs* round. *Leaves* radical, lanceolar, ribbed, plaited. *Scape* simple, erect, many-flowered, the three exterior petals, lanceolar, and green; the inner two oblong. Incumbent over the lip and column. *Lip* with a short horn, and three-lobed lamina, the middle one linear, oblong, pointed, with shaggy disk.

A native of the interior parts of Bengal. In the Botanic garden it flowers in June. The whole height is then about eighteen inches, the raceme and leaves are nearly equal, the

Page Carey Ed. flowers are rather remote, large, and fragrant, with the three exterior petals very long, expanding and quite green, the inner two and the lip pure white.

8. L. *recurvum. Willd.* iv. 124. *Corom. pl.* I. *N.* 39.

Bulbs undivided, round. *Lip* with a short horn, and shovel-shaped, entire, crenulate lamina. *Leaves* radical, broad-lanceolate, five-nerved. *Scapes* half the length of the leaves, retrofracted. *Spike* sub-globular.

A native of the moist valleys among the Circar hills. Flowering time the beginning of the rains.

Root; *bulbs* undivided, biennial, striated, nearly round, surrounded with one or two rings, with many thick, fleshy fibres from their lower parts. *Stem*, if it can be so called, from the side or the base of the bulb; but it is no other than the sheath of the three or four leaves united and enveloped in two or three abrupt sheaths, scarcely appearing above the ground.

Leaves broad-lanceolate, five-nerved, plaited, slender, a little waved round the margins, smooth, from six to twelve inches long, and three or four broad. *Scape* about six inches long, or rather less than half the length of the leaves, with a few sheaths surrounding it here and there. *Spikes* globular; the *apex* looks straight to the ground, many-flowered. *Bractes* sessile,
III. straight, lanceolate, one-flowered. *Flowers* numerous, crowded, middle sized, white, with a
470 small tinge of yellow. *Petals* nearly equal; *lip* broad; *apex* rounded, undivided, shovel-formed, crenulate. *Horn* scarcely any.

Note. The plant when in flower, looks well. I have raised them in my garden for some seasons, where the leaves remain most part of the year.

9. L. *nutans. Corom. pl.* I. *N.* 40.

Bulbs undivided, roundish, smooth; *lip* ovate-cordate, acute. *Scape* longer than the oblong, five-nerved leaves. *Raceme* nodding.

Bela pola. *Rheed. Mal.* xi. *t.* 35.

Malaxis *nutans. Willd.* iv. 93.

It is a native of the same places with the last. Flowering time the same.

It differs only from the former in the following respects. Here the bulbs are smooth, there striated. Here the leaves are oval, there lanceolate. Here the scape is longer than the leaves, there not half so long. Here the spike is oblong, and pendulous, there globular and retrofracted. Here the flowers stand at some distance from one another, there they are crowded. Here they are of a beautiful rose colour, there white. Here the lip is sharp pointed, there circular and crenulate.

10. L. *candidum.* R.

Herbaceous. *Leaves* two, sub-radical, lanceolar, finely nerved and plaited. *Scape* erect, much shorter than the leaves; *raceme* drooping. *Lip* oval, with scarcely any horn.

Mearmee the vernacular name near Silhet, where it is indigenous; and flowers during the hot season. Is nearly allied to L. *recurvum.*

Root tuberous, with very thick, soft, white, spongy fibres. *Stem* short, composed of the tubular petioles of the two leaves, embraced by two or three tubular sheaths. *Leaves* two,
III. lanceolar, about five-nerved and plaited, pointed, smooth on both sides; from six to twelve
471 inches long, besides the petioles, which are about six inches more, from three to four inches broad. *Scape* as long as the petioles of the leaves, and embraced by a few flower-bearing sheaths; *apex* short and drooping as in L. *recurvum. Flowers* of a middling size, white. *Bractes* ensiform. *Petals* five, oblong, spreading, the exterior three rather narrower, of which the lower two are considerably falcate. *Lip* much larger than the petals, oval, emarginate; *centre* tinged with pink, with a swelling behind, but no horn. *Column* short. *Pollen masses* two, sub-orbicular. *Lid* deciduous.

AERIDES. Swartz.

Corol five-petalled, spreading. *Lip* calcarate; *lamina* saccate. *Anther* a deciduous lid.

1. A. *guttatum. Roxb.*

Parasitic. *Stem* creeping. *Leaves* bifarious, imbricated, linear, channelled, obliquely præmorse. *Racemes* axillary, pendulous. *Flowers* pedicelled. *Lamina* entire, ascending, oblong; *sac* wide, and obtuse; *capsule* triangular.

Beng. Perida Mura.

This lovely parasitical species was found growing on trees in the vicinity of Dacca by the Honourable Charles Andrew Bruce, who sent plants to the Botanic garden at Calcutta. Flowering time the hot and rainy seasons, it has a great resemblance to the tables in Rheed's *Hortus Malabaricus*, quoted by Willdenow, for *Aerides retusum* and *præmorsum*, but the capsule differs from both and I believe the horn lip of the nectary also; however they are certainly very nearly allied, and not inferior in beauty, while in flower, to any of the whole order of *Orchidea.*

Root of several, thick, fleshy, obtuse fibres, which issue from the stem, through the sheaths
III. of the lower leaves, and adhere to the tree which gives support to the plant. *Stem* perennial,
472 creeping, invested in the sheaths of the leaves. *Leaves* bifarious, imbricated, sheathing, incurvate, linear, channelled, thick, firm, and smooth; *apex* obliquely præmorse, from six to twelve inches long, by one broad, when laid flat. *Racemes* axillary, solitary, drooping, longer than the leaves. *Flowers* numerous, pedicelled, approximate, diverging, pretty large, colour a beautiful mixture of red and white, spotted. *Bractes* ovate-cordate, one-flowered, embracing the insertion of the pedicel. *Corol*, or *calyx* of Swartz, five-petalled, the upper three oblong, the

middle or inferior one of these broader, the lower two semi-cordate. *Nectary, (labellum,* Swartz,*)* longer than the petals, and more deeply coloured, ascending, concave, cuneiform, with the apex slightly three-lobed, behind protruded into a large, open, obtuse bag, or horn. *Column* of fructification short. *Anthers* or polliniferous balls two, covered with a deciduous lid. *Germ* inferior, three-sided. *Stigma* an oblong clammy opening in the middle of the inferior, flat side of the column. *Capsule* pedicelled, oblong, three-sided; *angles* sharp, sides with a broad, flat keel, one-celled, three-valved. Page Carey Ed.

2. A. *cornutum.*

Parasitic, ramose. *Leaves* bifarious, linear, retuse. *Racemes* axillary, drooping. *Lip* with three-cleft lamina and hooked horn, rising forward and upwards.

Found growing in trees in the vicinity of Dacca, and the eastern frontier of Bengal, in flower in April, and sweetly fragrant.

Root of several, long, thick, fleshy cords, by which they bind themselves firmly to the trees they grow on. *Stems* perennial, often divided, decaying at the base, as they shoot from the apex, invested in the sheaths of the leaves. *Leaves* equitant, bifarious, sheathing, linear, smooth, channelled, drooping, obliquely præmose or retuse; from six to nine inches long, by from one to one and a half broad. *Racemes* sub-axillary, solitary, drooping, longer than the leaves. *Flowers* large, surrounding more than the exterior half of the stalks, diverging, white, with a tinge of pink, sweet-smelling. *Bractes* sub-reniform, one-flowered. *Petals* five, expanding, the upper one oval; the next two rather narrower, but of the same length; the lower two sub-orbicular and much larger than the other three. *Nectary* or *lip* very large; its lamina deeply three-parted, but closed like a case for the column of fructification; *lateral lobes* obliquely wedge-shaped, and truncate; the *middle* one sub-lanceolate with an incurved apex. *Horn* incurved into a very perfect hook; *apex* green and somewhat obtuse. *Column* of fructification very short, but protruded downward into a long concave receptacle for the lower two petals and nectary. *Lid* beaked. *Filament* single, rising with a bifid apex, from a beaked process, on the interior part of the top of the column. *Anthers* two, globular, deep yellow. *Stigma* immediately under the beak. *Germ* linear, twisted a little. III. 473

Note. My *Limodorum obtusicornu* no doubt belongs to the same genus with this. They are both most beautiful while in flower; in appearance *obtusicornu* has rather the advantage, but the sweet fragrance of the flower of this lovely modest looking species must give it a decided preference.

3. A. *suaveolens. Roxb.*

Parasitic, caulescent. *Leaves* bifarious, linear, bidentate. *Racemes* lateral, filiform, drooping. *Lamina* horn-shaped, unguiculate, with two oblong erect lobes at the base.

Found on trees in the forests of Chittagong, where it perfumes the air with the delightful fragrance of its flowers, the whole year round.

Stems rooting, short, slender, and simple, somewhat succulent, the whole length being only a few inches, and scarcely thicker than a crow's quill, perishing at the base as they shoot from the apex; from the most succulent parts, the fleshy roots issue, and fix to the tree that supports the plant. *Leaves* bifarious, sessile, stem-clasping, linear, fleshy, smooth on both sides; *apex* two-toothed from three to six inches long, and rather more than half an inch broad. *Racemes* lateral, much longer than the leaves, drooping elegantly. *Flowers* numerous, scattered round the whole of the raceme in great profusion, small; *colour* a yellow ground, spotted with purple, delightfully fragrant. *Petals* five, spreading, nearly equal, narrow, obovate. *Lip* between the lower two petals, and longer than them, though they are the longest of the five, united to the base of the style, by a perfect, short, linear claw. *Lamina* fleshy, horn-shaped, obtuse, perforated a little way up from the base and on each side of the perforation a conical lobe projecting up and inward to the apex of the style. *Stamina, pistillum* and *capsule* as in the genus. III. 474

4. A. *rostratum. Roxb.*

Parasitic, caulescent. *Leaves* bifarious, linear, channelled: *apex* præmorse. *Racemes* lateral, longer than the leaves. *Lip* clavate, sac-conical from the apex of the lamina, column beaked, with another on the posterior part near the base.

A parasitical species; in external habit like *præmorsum, retusum,* &c. but smaller, and the leaves more remote from each other. It is a native of the forests of Silhet, where it blossoms in April and May.

Racemes opposite to the leaves, or solitary, ascending, the length of the leaves, many-flowered. *Petals* five, nearly equal, spreading, rose-coloured, the lower two adhering to the under side of the posterior part of the lip, as in *Dendrobium* but forming nothing like a spur, or claw. *Lip* horizontal, of the colour of the petals, and about as long as they, clavate; there is a deep channel on the upper side, which descends into the conical bag or case, which points down from the apex of the lamina, in which before expansion, the recurved part of the beak of the style is lodged. *Style* or column very short, but continued in a long, ascending, purple beak, with a recurved white apex to this apex; the two, roundish *pollen balls* are attached by a white, flat filament, which is just as long as the beak, and allows the balls to rest in the posterior part of the apex of the body. *Column* opposite to the stigma, covered by the usual two-lobed anther. III. 475

5. A. *pallidum. R.*

Parasitic, caulescent. *Leaves* bifarious, linear, emarginate. *Racemes* lateral. *Lip* or *sac* slipper shaped, with two semilunar lobes at the base, column short, beaked from interior margin over the stigma. *Capsules* cylindric.

Found growing on trees in the forests of Chittagong and the eastern parts of Bengal. It

Page Carey Ed. flowers in May and June. It is a small species, the flowers also small and of an uniform pale yellow colour.

Root, stem and *leaves* as in the other species, but rather slender. *Racemes* lateral or opposite to the leaves, solitary, diverging, with the flower-bearing part much thicker and drooping. *Flowers* numerous, small, in one variety white, in another pale yellowish with a faint tinge of pink. *Petals* five, the upper and exterior oblong and concave, the lower two obliquely oval; the inner two obliquely oblong and rather smaller than the exterior three, and all shorter than the lip, which bears a very exact resemblance to a slipper. *Column* short, with a beak projecting forward over the stigma, and base of the lip; to its apex the proper filament is attached. *Pollen masses* globular. *Capsule* cylindric, slender as a crow's quill.

6. A. *multiflorum. R.*

Parasitic, caulescent. *Leaves* bifariously imbricated, linear, channelled, obliquely emarginate, with a hooked acumen. *Racemes* axillary or lateral, longer than the leaves, sometimes compound. The *lower* two exterior petals sub-rotund. *Lip* with broad-cordate, entire lamina, and a short obtuse horn projecting under it. *Capsules* clavate, three-sided.

III. 476 A large and beautiful species, with copious, very long, sub-erect racemes of numerous, pretty large, pink-coloured flowers: A native of Silhet, where it grows on trees and flowers during the hot season.

7. A. *ampullaceum. R.*

Parasitic, caulescent. *Leaves* bifariously imbricated, linear, emarginate. *Racemes* axillary, short. *Petals* oval, nearly equal; *lip* with a long, flagon-shaped bag, and linguiform lamina.

Found by Mr. M. R. Smith growing on trees in the forests, in blossom in May.

Stems short and generally simple, from the lower part throwing out the fleshy, strong, radical cords, by which they are bound to the parent tree; they are only a few inches long, decaying at the base, as they shoot from the apex. *Leaves* sheathing bifariously, imbricated, linear, hard and glossy, obliquely emarginate, about six inches long. *Racemes* axillary, scarcely one third the length of the leaves, erect; rachis withering and remaining. *Flowers* numerous, small, rosy. *Petals* nearly equal, oval, and spreading. *Lip* with a sac, or bag, pendulous, and twice as long as the petals; *lamina* short; linguiform. *Column* short. *Pollen masses* two and globular. *Capsules* clavate, six-ribbed.

8. A. *radiatum. R.*

Parasitic. *Stems* bulbiform, with a single lanceolar leaf from the apex of each. *Scape* umbelliferous, the lower two petals very long and falcate. *Lip* conical, recurved, cellular.

Found by Dr. W. Carey indigenous on trees in the Delta of the Ganges, where it blossoms about the beginning of the rains.

Root of many, hard, slender fibres. *Stems* no other than the little remote round bulbs, which are connected by a slender shoot of about an inch in length. *Leaf* a single one from the III. apex of each bulb, lanceolar, somewhat channelled, fleshy and smooth, from three to four inches 477 long, and less than one broad. *Scape* from the base of the bulb, longer than the leaves, filiform, invested in a few, small, remote sheaths. *Flowers* about ten or twelve, a semiradiate umbel in the apex of the scape, rather small; prevailing colour yellow. *Petals* very unequal; the upper three ovate, striped with purple lines and ciliate margins, that of the apex larger, and filiform, those three are only a little longer than the column, the lower two falcate, five or six times longer than the upper three, united at the base under the lip which they completely embrace and hide, they are of an uniform yellow colour, and on account of their great size, when compared to the rest of the flower, give to the whole that colour. *Lip* united to the base of the column by an incurved claw, somewhat conical, but much recurved, internally cellular. *Column* short, interior margins winged. *Pollen masses* two, globular, covered by a two-lobed deciduous lid.

DENDROBIUM. Swartz.

Corol five-petalled, erecto-patent; the two exterior, lateral ones, united round the base of the lip into a horn-like process. *Lip* attached to the base of the column. *Anther* a terminal, deciduous lid.

1. D. *aggregatum. Roxb.*

Bulbs aggregate, with a solitary, linear oblong, smooth, emarginate leaf from the apex of each. *Scapes* from the side of the bulbs, drooping, many-flowered. *Lip* reniform, emarginate.

Received into the Botanic garden, from Mr. Pierard; who found it growing on the trunk of *Lagerstroemia regina* in the northern border of Arracan, and observes that it is found in III. the woods always only on that tree.* It blossoms in March, but produces no fruit.

478 *Root,* from the contracted base of the bulbs issue many small, fleshy, ramous fibres, matted together, and adhering to the tree on which the plant grow. *Bulbs* aggregate; they may also be reckoned swelled stems, though I would rather call them bulbs; particularly as there is an articulation which unites the proper petiole to the apex of the bulb, and at that place the leaf drops off, leaving the permanent bulb naked; until the new leaf comes out they are smooth, oblong, tapering equally towards each end, more or less octangular, according as they are plump or lean, from two to three inches long, and marked with two or three annular rings, the cicatrices of the sheath of the petioles of the former leaves, where some of their longitudinal fibres also remain. *Leaves* a single one, rarely two from the apex of each bulb, short-petioled, oblong, entire, emarginate, veinless, and of a firm leathery texture, with a smooth shining

* It is also found to grow well on the mango tree in the Botanic garden.

surface, from four to six inches long, and from one to two broad. *Raceme*, or *scape*, from the side of the bulb, drooping, many-flowered. *Flowers* numerous, alternate, large, beautiful, of a bright yellow. *Bractes* solitary, small, pointed, one-flowered. *Corol*, the exterior three petals sub-triangular, united round the insertion of the flower on the germ and horn of the petals; the inner two oval, and larger. *Lip* much larger than the petals, sub-reniform, emarginate, of a deep yellow in the centre and paler round the margin. *Column* of fructification, or style short. *Stigma* a funnel-shaped opening in the fore-side of the column, which communicates with the belly of the germ. *Anthers* oblong, two-lobed, and covered with a two-lobed, lid. Page Carey Ed.

2. D. *tripetaloides. R.*

Parasitic. *Stems* bulbiform, with the scape from the base of the bulb, many-flowered; *exterior* three petals lanceolately conic; *inner* two minute. *Lip* linguiform.

Found on trees in the forests near Rangoon by the Rev. Mr. F. Carey, and by him sent to the Botanic garden, where it blossoms in the cool season. III.

Scape from the base of the bulb, simple, naked, slender smooth, from three to five inches long. *Racemes*, or flower-bearing part longer than the scape, round. *Flowers* numerous, middling sized, white, scattered over every part of the raceme. *Bractes* solitary, ensiform, one-flowered. *Petals*, the *exterior* three lanceolate-conic, acute, one in each side and one above; the *inner* two linear, oblong, minute, and ciliate. *Lip* linear, obtuse, recurved, shorter than the three exterior petals, and attached by a slender isthmus, to the lower edge of the base of the exterior two, colour an uniform brownish orange. *Column* and other parts, as in the genus. 479

3. D. *pumilum. R.*

Parasitic. *Leaves* two from the apex of each of the turbinate bulbs. *Peduncles* solitary between the pair of leaves, one-flowered.

This is the smallest species I have yet met with, it grows on trees in the forests of Chittagong, where it blossoms during the rains.

Parasitic, stemless, or rather, the stems bulbiform; *leaves* from three to four, rising from each bulb, lanceolar, even, smooth and rather fleshy. *Scapes* from the base of the bulb; raceme villous, bearing many erect flowers; the inner two petals linear. *Lip* recurved, with somewhat three-lobed lamina.

Found indigenous on trees in the forests of Chittagong, from thence introduced into the Botanic garden where it blossoms in February.

Root, consisting of many firm, slender, tortuous fibres, which adhere to the parent tree. *Stem* no other than the ovate oblong, smooth, green, somewhat compressed, solid bulbs, which give support to the leaves; they multiply by short suckers from the base of those of the former years, and are generally from half an inch, to an inch asunder. *Leaves* about four, from and around the apex of each bulb, narrow lanceolar, smooth, and fleshy, from four to eight inches long, and one or one a half broad. *Petioles* short, channelled, sheathing. *Scapes* generally solitary, from the base of the bulbs, spreading; base embraced by a few sheaths, the rest downy. *Raceme* generally simple, which with the scape is about as long as the leaves and bulb, somewhat flexuose, downy, many-flowered. *Flowers* remote, pedicelled, erect, of a middling size, yellow, inodorous. *Bractes* ensiform, one below each pedicel. *Petals*, the exterior one, sub-triangularly-lanceolate, the interior two linear-lanceolar. *Lip* recurved, with a small lobe on each side below the middle; *apex* retuse with a point in the sinus. *Pollen masses* composed of twice two pair of minute, oval, compressed, yellow grains. *Column* half the length of the two inner petals. III. 480

4. D. *cruminatum. R.*

Parasitic. *Stems* simple, swelled, and angular near the base. *Leaves* bifarious, stem-clasping, linguiform. *Flowers* suspended near the apex of the stem. *Lip* three-lobed; the *lateral lobe* incurved into a tube; *lamina* roundish, acuminate.

Angræcum nonum. *Rumph. Amb.* vi. *p.* 104. *t.* 47. *f.* 2.

A native of Amboyna, and from thence brought to the Botanic garden at Calcutta by Mr. C. Smith. Flowering time, in Bengal, the rainy season.

Root consisting of many, perennial, green, fleshy fibres, spreading over, and adhering firmly, to the parent tree. *Stems* several, sub-erect, swelled above the base and there octangular, from thence to the apex slender, round, tapering, gently invested in the sheaths of the leaves, or if they have fallen, marked with their annular cicatrices and a few slender bristles; the whole length from two to three feet. *Leaves* bifarious, sheathing, linguiform, entire, smooth, firm, and fleshy, veinless; from two to four inches long, and about one broad. *Flowers* sessile, except the curved slender germ be considered a peduncle, solitary from the last two, three or four leafless joints of the stem, large, pendulous, suspended on their curved, slender, filiform pedicel, faintly fragrant. *Bractes* three-fold, one-flowered, short, sheathing the base of the germ. *Corol* almost pure white, besprinkled with minute, pellucid dots, like the grains of fine loaf-sugar; *petals* unilateral, sub-lanceolate, the lower two longer, united to, and protruded with the column of fructification of the apex of the horn of the nectary. *Lip* occupying the under side, opposite to the petals, and like them sprinkled with the same pellucid specks; *horn* or *pouch* large, and conical; *lamina* three-lobed, on the centre a yellow line runs the whole length; *lateral lobes* incurved; *terminal* one nearly round, and pointed from the exterior portion of the margins being incurved; all, particularly the last mentioned, are beautifully marked with pink-coloured, curved, ramous veins, and the margins elegantly fringed. *Column* of the fructification nearly half the length of the lip, on the apex rest two, very perfect, yellow anthers. *Germ* filiform, recurved, not visibly twisted, the length of the horn of the nectary. *Stigma* a large opening on the fore part of the column a little below the anthers, and directly opposite to the germ, which it penetrates deeply. III. 481

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5. D. *clavatum. R.*

Parasitic. *Stems* club-shaped; *bulbs* with three or four broad lanceolar leaves from the apex of each. *Racemes* lateral; *petals* nearly equal; *lip* shovel-shaped, entire.

Found growing on trees in the forests which cover the Garrow hills, where it is called *tiluscou.* Flowering time the hot season, chiefly April.

Root consisting of innumerable, firm, fleshy, vermicular cords, by which the plants adhere firmly to the parent tree. *Stems* numerous, bulbiform, clavate, tapering into a hard, fibrous, slender peduncle, between the bulb and root, giving to the whole the appearance of a club, hence the specific name. *Leaves* from three to four from the apex of each stem or
III. bulb, broad-lanceolar, lucid, firm, about seven-nerved; five or six inches long, by one or two
482 broad. *Racemes* from the side of the bulb, about as long as the leaves. *Flowers* pretty large, of a lively yellow colour. *Bractes* large, oblong, membranaceous, one-flowered. *Petals* five, nearly equal, oval, and obovate. *Lip* the length of the petals, with the side incurved toward the base; *lamina* shovel-shaped, with crisped margins, and the colour deeper than the rest of the corol. *Genitalia* as in the genus. *Capsule* clavate, six-ribbed, smooth and leaved.

6. D. *veratrifolium. R.*

Parasitic. *Leaves* lanceolar, from three to seven-nerved, several, from the apex of the long conic bulb, forming a stem with their long tubular, concentric sheaths. *Scape* many-flowered; *petals* sub-lanceolar; *lamina* with a broad, three-lobed apex; the *middle* one plaited and curved.

Hatakeveree, the vernacular name in the Garrow country, where it is indigenous; flowering in April and May.

Root of many, strong, fleshy fibres from the base of each bulb, by which they adhere to the parent tree. *Bulbs* long, and rather slender for the size of the plant, tapering off into a stem, formed by the long, concentric, tubular sheaths of the leaves, from two to four feet long, giving a total length of from three to five feet, leaves included, to the whole plant. *Leaves* from four to six from each bulb; sparse, sheathing, lanceolar, from three to seven-nerved and somewhat plaited, smooth, acute; from six to eighteen inches long, and from two to four broad. *Scape* from the base of the bulbs, generally solitary, about twelve inches long; the *lower* three fourths naked, invested in a few remote sheaths; the *upper portion* or *raceme,* about one fourth part of the whole, and bearing from ten to twenty large, beautiful, yellow flowers. *Petals* five, nearly equal, spreading, sub-lanceolar. *Lip* large and longer than the petals, projecting behind into a large conical horn; *apex* of the *lamina* broad, three-lobed, the middle lobe beautifully curled, and of a much brighter colour.

III. 7. D. *Pieradi. Roxb.*

483 Parasitic, caulescent, pendulous. *Leaves* bifarious, lanceolate, emarginate. *Flowers* peduncled, from one to two or three from the joints of the leafless stems. *Lip* entire, tubular toward the base.

Sent with some other species, from Chittagong to this garden, by Mr. Pierard. This beautiful parasitic is a native of that place, as well as of various parts of the Delta of the Ganges, where it is generally found on mango trees.

Root perennial, fibrous, adhering to the parent tree. *Stems* perennial, numerous, simple, drooping, round, smooth, jointed, while young leaf-bearing, but as they advance in age the leaves drop, and they ever afterwards remain naked, except when decorated with blossoms, generally from two to five feet long. *Leaves* alternate, sessile on their sheaths, lanceolate, smooth, firm and shining on both sides; from two to four inches long, and about one broad. *Flowers* one or two, rarely three, on very short peduncles, which issue from the joints of the stems. They are large and of a pale yellow colour. *Corol;* the *exterior* three petals narrow, tapering from the base, with the margins recurved; the *inner* two broader, and oblong. *Lip* the length of the petals, shovel-shaped, with the margins slightly curled, and somewhat ciliate, towards the base incurved into a tube, which conceals the column of fructification. Its very pedicel is protruded from the base of the style, or column of fructification. *Germ* inferior, &c. as in the rest of this natural order. *Column* of fructification, or the term *style* might still be a better one, short, hid in the involute tubular portion of the lip near the base, semi-circular, with flat, furrowed lamina. *Stigma* on the interior side of the column, a little below the apex is a hollow, glutinous gland with a very perfect perforation, which ends in the cavity of the germ; this I consider to be the real *style* and *stigma,* or in other words, the organ by which the powers of the male are conveyed to the female. *Stamina; filaments* two,
III. exceedingly short and slender, joining the posterior small end of the two, obovate, oblong an-
484 thers to the posterior part of the two-lobed concavity. *Receptacle* of the *anthers* on the apex of the style. *Lid* or *veil* mitre-shaped, emarginate.

8. D. *purpureum. R.*

Parasitic. *Stems* simple, pendulous, in flower leafless; *leaves* bifarious, lanceolate. *Flowers* numerous in dense ovate heads. *Lip* linear, oblong, entire.

Angræcum purpureum. *Rumph. Amb.* vi. *t.* 50. *f.* 1.

A native of the Moluccas, from thence introduced into the Botanic garden, where it blossoms in February and March.

Root of numerous fleshy fibres, adhering in all directions to the trunks and branches of trees, here it thrives best on the mango tree. *Stems* perennial, several, pendulous or nearly so; for the first year or two fleshy, when old naked, marked with the circular cicatrices of the fallen leaves; they are then somewhat rugose, longitudinally furrowed, and thickest toward the middle; the general length three or four feet. *Leaves* alternate, bifarious, sessile on their smooth, cylindric sheaths, spreading, lanceolate, entire, of a slender texture, and polished

on both sides; from four to six inches long, and about one broad. *Bractes* cordate, acute, one-flowered. *Flowers* numerous, in dense, ovate, solitary heads, from the cicatrices of the leafless stems, small and of a lively purple. *Corol* five-petalled, &c. as in the genus, with a large obtuse horn. *Lip* sub-cylindric, with ovate, rather pointed, entire lamina. Page Carey Ed.

9. D. *pendulum. R.*

Parasitic. *Stems* simple, pendulous, contracted at the joints and base, when old leafless. *Leaves* on the young shoots, bifarious, linear. *Flowers* in pairs from the joints of the old leafless stem, drooping; *petals* sub-equal, lanceolate; *lip* sub-orbicular, short-clawed. *Capsules* clavate, obscurely six-ribbed.

Found growing on trees in the forests of Chittagong, in flower during the hot season. It seems to approach the nearest to D. *moniliforme*, and if Kæmpfer's figure were inverted, they might be taken for the same. III. 485

10. D. *teres. Roxb.*

Parasitic. *Stem, branches* and *leaves* all columnar. *Racemes* leaf-opposed, and of their length, few-flowered. *Stamina* stem-shaped, and bifid.

Found on trees in the forests of Chittagong and Silhet, where it blossoms during the hot months of April, and May, when nothing can exceed its beauty.

Root of thick, fleshy, crooked, lateral cords, which embrace firmly the parent tree. *Stem* ramous, and with the branches columnar and smooth. *Leaves* remote, bifarious, columnar, smooth, from six to eight inches long, and as thick as a common quill. *Racemes* leaf-opposed, from six to twelve inches long, flexuose, round, smooth. *Bractes* ovate, one-flowered. *Flowers* generally from three to six on the raceme, but immensely large as they expand fully four inches, of a lively pink colour, with the large conic horn ferruginous. *Corol;* the *exterior* three petals oblong; the *lower* two obliquely so; the *interior* ones nearly round. *Lip*, its posterior part united with the insertion of the exterior lower two petals into a large ferruginous conic horn. *Lamina* deeply three-lobed; *lateral lobes* incurved round the column; the *middle* one fan-shaped, and bifid. *Germ, column, anther*, and *stigma* as in the genus. *Capsule* clavate, three-sided, down the middle of each side is a three-sided rib.

11. D. *formosum. R.*

Parasitic, caulescent. *Leaves* bifarious, sessile, lanceolate; *peduncles* terminal, few-flowered. *Lip* sub-panduriform, retuse.

Found on trees in the forests of Silhet and the Garrow mountains; in flower in April and May.

Root of fleshy, crooked, cord-like fibres, which embrace the parent tree, as in other similar parasites. *Stems* many, cylindric, a little furrowed, and while young well clothed with short black hairs, which in time are rubbed off. *Leaves* bifarious, rather remote, half stem-clasping, lanceolate, obtuse, or emarginate, smooth, firm and rather fleshy, from three to four inches long, by one or one and a half broad. *Peduncles* terminal, solitary, racemiform, from two to four-flowered. *Flowers* very large, pendulous, scarcely inferior to those of D. *teres*, expanding, three inches and a half, of a pure shining white, except the middle of the lip, which is yellow, sweetly though faintly fragrant. *Corol;* the *exterior* three petals lanceolate, acute and ribbed; the *interior* two oval, and more faintly ribbed. *Lip*, its posterior portion, beyond the insertion of the whole flower on the germ, united its whole length with the base of the two lower exterior petals into a large conic horn. *Lamina* panduriform, with a retuse apex. *Column*, &c. as in the genus, and well described by Swartz. III. 486

12. D. *pulchellum. R.*

Parasitic, caulescent. *Leaves* bifarious, sessile, lanceolate, obtuse, finely ribbed. *Raceme* lateral on the old leafless stems; *lip* with a large obtuse horn, and obcordate, ciliate, ramentaceous lamina.

Found indigenous on trees and in rocks in the forests of the Silhet hills, in flower in May and June. A very beautiful species, the flowers are considerably smaller than in D. *formosum*; but the colour more lively.

Root of numerous, strong, pack-thread-like fibres, which fasten on trees or rocks. *Stems* many from the same tuft of roots, simple, nearly straight, furrowed, otherwise smooth and rather lucid, marked with the circular scars of the fallen leaves, about three feet long, and thicker than a *fatan*, while young well decorated with leaves, when old leafless, and then floriferous. *Leaves* alternate, sessile, rather remote, narrow lanceolar, obtuse, finely ribbed; from four to five inches long, by one broad. *Racemes* lateral, from the old leafless stems or branches, diverging, flexuose, with one large pale, pink flower at each of the six or eight curvatures. *Bractes*, one at the insertion of each pedicel, long and tapering. *Petals* five, of the exterior three the upper one is lanceolar, the pair falcate and rather larger; the interior two oval. *Lip* with a pretty large obtuse horn, and broad, spreading, beautifully coloured, obcordate lamina, which is rather shorter than the petals. III. 487

13. D. *anceps. Willd.* iv. 136.

Parasitic, caulescent. *Leaves* distichous, equitant, fleshy, broad-ensiform. *Peduncles* from the sheaths of the leaves, one-flowered.

This interesting rather small species is found on trees in the Delta of the Ganges: in flower during the hot season.

14. D. *acinaciforme. R.*

Parasitic. *Stem* and *branches* flat, thin, slender, two-edged. *Leaves* stem-clasping, bifarious, scimitar-shaped. *Flowers* suspended from the terminal joints of the then leafless twigs. *Lip* one-lobed, crenulate.

Herba supplex. *Rumph. Amb.* vi. *p.* 110. *t.* 51. *f.* 2.

Page Carey Ed. A native of Amboyna, from thence sent to the Botanic garden where it blossoms during the rains.

Root of numerous, firm fibres, adhering firmly to the parent tree. *Stems* and *branches* a little drooping, or straggling, jointed, and smooth, at the base round, slender, of a very firm texture; above enlarging considerably and becoming perfectly flat, indeed thin, with two sharp edges. *Leaves* on the young shoots only, alternate, bifarious, sessile on their permanent sheaths, acinaciform, or they may be called semi-lanceolate, pointed, firm, fleshy, smooth, veinless; from two to three inches long, and about half an inch broad. *Sheaths* as long as the joints, and like them compressed. *Flowers* from the joints of the leafless branches suspended on
III. their slender pedicel-like germs, very small, every part yellow, even the centre of the nectary.
488 *Bractes* several, minute, surrounding the insertion of the germ with the joint of the branchlet. *Corol* slipper-shaped, split on the under side to the apex of the large horn, the inner two petals small and adjoined as if distinct. *Lip* obovate cuneate, emarginate; interior margins crenulate, and slightly waved.

15. D. *calceolum. Roxb.*

Parasitic. *Stem* and *branches* straggling, thin, two-edged. *Leaves* bifarious, stem-clasping, fleshy, ensiform. *Flowers* suspended from the joints of the extremities of the leafless slender twigs. *Lip* three-lobed; *middle lobe* emarginate.

Herba supplex. *Rumph. Amb.* vi. *p.* 110. *f.* 3.

A native of Amboyna, from thence brought to the Botanic garden, where it blossoms during the rains.

Root perennial, consisting of numerous, fleshy fibres adhering to the parent tree. *Stems* and *branches* perennial, long, slender, jointed, flat, two-edged, straggling or hanging to a length of many feet, frequently striking root from the joints, for the most part invested in the permanent withered sheaths of the leaves. *Leaves* on the young shoots only, bifarious, sessile on their permanent sheaths, ensiform, firm, fleshy, veinless; from two to three, inches long, and about half an inch broad. *Sheaths* as long as the joints, smooth, compressed, fleshy, withering. *Flowers* from the joints of the extreme naked twigs, pretty large, pendulous on the slender peduncle-like germs, of a dull orange colour and slightly veined with dull red. *Bractes* several, minute. *Corol* slipper-shaped. *Lip* with the apex two-lobed; the *exterior lobe* emarginate, all are slightly crenulate and curled.

GYNANDRIA HEXANDRIA.

ARISTOLOCHIA. Schreb. gen. N. 1383.

III. *Calyx* none. *Corol* one-petalled, with a tongue-shaped border and gibbous base. *Germ*
489 six-celled; *cells* many-seeded, attachment central. *Capsule* inferior, six-celled, many-seeded.

1. A. *acuminata. Willd.* iv. 157.

Perennial, twining, smooth. *Leaves* cordate, rather acuminate. *Racemes* axillary, simple or compound, drooping.

A native of the eastern parts of Bengal, where it flowers during the hot and rainy seasons, and the seed ripens in December and January.

Stem and *branches* twining to an extent of some fathoms, perennial, younger shoots angular, and smooth. *Leaves* alternate, petioled, cordate, entire, somewhat acuminate, smooth; *lobes* large, and roundish, from four to six inches long, by from two to four broad. *Petals* about an inch long, slightly channelled. *Racemes* axillary, simple or compound, drooping, shorter than the leaves. *Flowers* large, drooping, of a dark-greenish purple. *Corol* with a funnel-shaped tube, globular base, and long, linear, somewhat acute lamina, the sides of which, soon after expansion, become revolute. *Stamina* as in the genus. *Germ* inferior, sub-cylindric, furrowed, six-celled, in each many ovula in one vertical row attached to the axis; *style* none; *stigma* peltate, with a converging, six-lobed apex.

2. A. *Indica. Willd.* iv. 157.

Shrubby, twining. *Leaves* cordate, cuneate, scolloped. *Peduncles* many-flowered.

Beng. Eeshwur-mool.

Careloe Vegon. *Rheed. Mal.* viii. *t.* 25.

Teling. Isaro.

A native of copses, and jungles where the soil is dry and poor. It flowers during the wet season.

Root much like that of *Sarsaparilla*, perennial. *Stem* twining, below woody; *young shoots*
III. striated, smooth. *Leaves* alternate, petioled, somewhat wedge-formed or obovate, three-nerved,
490 pointed, waved, scollopped, smooth, from two to four inches long and from one to two broad. *Racemes* axillary, shorter than the leaves; bracted. *Flowers* erect. *Anthers* six pair, as in A. *bracteata. Capsules* oblong, pendulous.

The roots, like those of *bracteata*, are nauseously bitter, and I think rather more so than they are.

3. A. *longifolia. Roxb.*

Twining. *Leaves* linearly-cordate, sagittate, with the barbs, or lobes rounded, three-nerved, entire and smooth. *Racemes* axillary. *Stigma* cup-shaped, with a three-toothed margin.

A native of the Moluccas.

4. A. *bracteata. Retz. Obs.* v. *N.* 80. *Willd.* iv. 160.

Perennial. *Stem* and *branches* weak, trailing. *Leaves* reniform. *Peduncles* axillary, one-flowered, bracted.

Teling. Gardi Gavapoo. Page Carey Ed.

A native of cultivated, generally, garden ground, and the banks of rivers, or water-courses, where it can have a rich, moist soil, on the coast of Coromandel. It flowers most part of the year.

Root perennial, long, slender, simple, perpendicular, waved, with many small fibres issuing from every part of it. *Stems* or *branches* several, weak, resting on the ground, waved, striated, from twelve to eighteen inches long. *Leaves* alternate, petioled, kidney-formed, beautifully, though slightly, curled round the margin, a little rugose, glaucous underneath; about two inches each way. *Petioles* channelled. *Flowers* axillary, single, peduncled. *Peduncles* drooping, near the base there is a kidney-shaped, curled, sessile bracte. *Corol*, upper part of the tube and tongue erect; the latter has its margins revolute; the colour a most beautiful dark purple, and covered on the inside with hairs of the same colour. *Anthers* six pair. *Capsules* ovate.

Every part of this plant is nauseously bitter, which remains long, chiefly about the throat. III.

For a purging with gripes, two of the fresh leaves are rubbed up in a little water, and given to an adult for a dose, once in twenty-four hours. 491

CLASS XXI.

MONOECIA MONANDRIA.

AMBROSINIA. Schreb. gen. N. 1383.

Spathe one-leaved. *Calyx* none. *Corol* none. *Stamina* inserted round the top of the style. *Capsule* many-seeded.

1. A. *ciliata. Roxb.*

Leaves long-petioled, lanceolar. *Spathe* shorter than the leaves, with a tubular base, and expanding, ciliate apex. *Capsule* six-celled.

Beng. Kerali.

Found on the wet banks of rivulets, ponds, and wet places in Bengal. Flowering time the hot season.

Root perennial, perpendicular, tuberous, stoloniferous with long fleshy fibres. *Leaves* radical, petioled, lanceolate, veinless, somewhat fleshy, from six to thirty-six inches long. *Petioles*, upper half cylindric, lower half sheathing; some spathaceous bractes surround their lower parts. *Scapes* axillary, solitary, short, somewhat compressed. *Spathe*, base tubular, and somewhat gibbous, middle portion cylindric, and convolute; *apex* expanding, sub-lanceolate; *margins* ciliate with a long, flexible purple filament; the lower tubular portion where the fructification is lodged is half separated by a transverse membrane from the upper portion as in A. *spirale*. *Filaments* none. *Anthers* numerous, sessile, surrounding the lower portion of the stigma. *Germ* conical, crowned, six-celled as in the ripe state. *Style* cylindric. *Stigma* oblong, apex turbinate, the lower portion surrounded with anthers. *Capsule* rounded, six-furrowed, and crowned with the six corresponding points of the ridges, six-celled. *Seeds* from six to eight in each cell, affixed by their bases to a central receptacle, each is augmented by a large spongy substance, or envelope. *Embryo* erect, furnished with a perisperm, and many subulate cotyledons as in *Pinus*. III. 492

2. A. *spirale. R.*

Leaves petioled, linear-lanceolate. *Spathe* sessile, much shorter than the leaves, twisted. *Capsule* five-celled, at least the germ has five distinct cells.

Arum *spirale. Retz. Obs.* ii. *p.* 30-1. *Willd.* iv. 486.

A native of the moist shady banks of ponds, or standing sweet water on the coast of Coromandel.

Root perennial, stoloniferous. *Stem* none. *Leaves* radical, petioled, narrow-lanceolar, smooth, from six to eight inches long, and about half an inch broad. *Petioles* sheathing. *Scapes* scarcely any. *Spathe* axillary, about as long as the petioles of the leaves, the lower portion, or chamber of fructification hid and shut; the upper portion thereof open at the base; above shut, and twisted, of a dark purple colour, particularly the inside, and there transversely rugose.

3. A. *retrospirale. R.*

Leaves linear-lanceolar. *Spathe* first twisted to the right, and there closed; then to the left, and there open. *Capsule* five-celled, five-valved.

A native of the northern parts of Bengal, it delights in a moist soil.

Root consisting of white brownish, long, fleshy fibres. *Stem* none. *Leaves* petioled, linear-lanceolar, smooth, entire, from six to twelve inches long. *Petioles* enlarging at the base into sheaths for those within. *Scape* scarcely any. *Spathe* inverted round the base of the germ, and rising amongst the leaves to nearly the same length, below the part where the fructification is lodged a little swelled, and half hid in the earth, the next four or five inches erect, cylindric, completely closed, and twisted to the right; above this there is still about one third of the spathe which is open, and much twisted to the left, the whole of a dull green colour on the outside, and streaked with dark purple within. *Corol* none. *Filaments* none. *Anthers* numerous round the stigma or apex of the style, immediately below them are several, sub-cylin- III. 493

Page Carey Ed. dric glands in a verticel round the style. *Pistils* in the swelled base of the spathe. *Germ*, superior, conical, five or six-lobed, each lobe crowned with a large gland. *Style* cylindric. *Stigma* firmly united to the semi-partition, which crowns the chamber of fructification. *Capsule* conical, from five to six-celled, from five to six-valved, opening from the apex. *Seeds* a few in each cell.

It comes exceedingly near A. *spirale* in appearance, yet differing very widely from it. First, in the lower part of the spathe being closed and twisted to the right, then the upper portion to the left and open; and in the partition thereof being incomplete. Secondly, in having nectarial glands round the style beneath the anthers. Thirdly, in having a capsule of five or six cells, and a few large seeds in each.

4. A. *unilocularis. R.*

Stemless. *Leaves* linear-lanceolate. *Spathe* as long as the leaves, twisted. *Capsules* one-celled.

Teling. Pechika, boora-gadee.

A native of Coromandel, in marshy places, and borders of lakes, where it is partly in sweet water. Flowering time the rainy season.

Root fibrous, stoloniferous. Stemless. *Leaves* radical, erect, ensiform, smooth, below ex-
III. panding to embrace those underneath; from nine to eighteen inches long, and about one broad.
494 *Scape* axillary, short, erect, compressed, growing broader towards the apex. *Spathe* as long as the leaves, erect, below convolute; above the spadix twisted like a screw to a very fine, straight point; there is an horizontal partition which separates in a great measure, the upper twisted part from the gibbous part below; colour of the outside purplish, that of the inside much deeper, and beautifully spotted with darker spots. *Corol* none. *Nectary*, four or five oval, anther-like glands, crowning the top of the germ, round the style. *Filament* scarcely any visible. *Anthers* very numerous, surrounding in form of a globe the top of the style just below or even touching the partition. *Pistil*, in the lower convolute belly of the spathe. *Germs* conical. *Style* filiform, the length of the belly of the spathe. Its apex is firmly united to the horizontal partition above-mentioned. *Pericarp; capsule* leathery, conical, one-celled, one-valved. *Receptacle* conical, affixed at the base and apex, free round the sides. *Seeds* numerous.

ARUM. Schreb. gen. N. 1387.

Spathe one-leaved, cowled. *Spadix* or *receptacle* with the female florets round the base, stamineous about the middle and naked above.

SECT. I. *With simple Leaves.*

1. A. *colocasia. Willd.* iv. 481.

Stemless. *Leaves* peltate, ovate, repand, semi-bifid at the base. *Scape* shorter than the petioles. *Spathe* much longer than a spadix, cylindric, erect; *club* sub-cylindric, length of the antheriferous part of the receptacle. *Anthers* many-celled.

Sans. Kuchoo.

Beng. Goori-Kuchoo.

III. A. *Ægypticum. Rumph. Amb.* v. *t.* 109.
495 *Teling.* Chama-Kura.

There are two varieties of the species cultivated in the vicinity of Calcutta, viz. Goori-Kuchoo just mentioned, and Asoo or early Kuchoo: small offsets from the larger tubers are, like potatoes, planted about the beginning of the rains in May or June, in a well laboured, friable, rich soil, not subject to be inundated. The roots of Asoo Kuchoo are taken up about the close of the year; those of Goori-Kuchoo, in February and March. Besides these two, there are three wild varieties of this species, found in most parts of India, viz.

1*st.* Kalla or dark-coloured Kuchoo, found on the edges of ditches, and other wet places. The leaves and the petioles are more or less tinged with purple, and the roots never swell in the manner the cultivated varieties do, but send out numerous runners. The leaves, and their foot-stalks, are the parts chiefly eaten by the natives of Bengal.

Caladium aquatile. *Rumph. Amb.* v. *t.* 110. *f.* 1. seems to be this variety.

2*d.* Char-Kuchoo, grows on dry ground, chiefly by road sides, on dung hills, and among rubbish, it differs from the other varieties in having the disk of the leaves marked with dark purple or bluish black clouds.

3*d.* Bun-Kuchoo. In situation and form every way like the last, but of an uniform green colour. The last two are rarely eaten by the natives of Bengal, where better vegetables are plentiful and easily procured.

Caladium vicorum. *Rumph. Amb.* v. *p.* 318.

2. A. *nymphæifolium. R.*

Stemless. *Leaves* peltate, ovate repand, semi-bifid at the base. *Scape* shorter than the petioles. *Spathe* much longer than the spadix, sub-cylindric, erect; *club* slender, acute, scarcely half the length of the antheriferous part of the receptacle. *Anthers* many-celled.

Caladium *nymphæifolium. Willd.* iv. 488.

III. *Beng.* Sar-Kuchoo.
496 Weli-ila. *Rheed. Mal.* xi. *t.* 22.

I doubt if this can be reckoned any thing more than a large aquatic variety of *Colocasia*. In Bengal it is rarely cultivated, but found wild in abundance on the borders of lakes, and pools of fresh water. Every part of this plant is eaten by the Hindoos. The root or rather

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subterraneous stem, often grows to the length and thickness of a man's arm. The petioles, scape and leaves, are of a reddish colour, and the plants considerably larger than any of the varieties of *Colocasia* just mentioned: yet the leaves are narrow in proportion to their breadth. The only good specific mark to know it from *Colocasia* by, is the shortness of the club of the spadix.

3. A. *viviparum. Roxb.*

Stemless. *Leaves* peltate, cordate, acuminate. *Root* flagelliferous and these runners bearing scaly, viviparous bulbs in clusters.

Maravara Tsjembo. *Rheed. Mal.* xii. *t.* 9.

A native of Nepal as well as Malabar. From the former place Dr. Buchanan sent the minute bulbs to this garden, where they produced complete plants in a short time and though now eight years old, have never blossomed; nevertheless, in Nepal, Dr. Buchanan observed they bore the common flower of the *Arums;* hence there can be no doubt of the genus. Here they produce annually in the rainy season abundance of the bulbiferous radical spikes, and by these the plant is readily propagated.

Root biennial, or more, consisting of a small, roundish tuber, which is abundantly furnished with the usual fibres, while from its apex the foliage rises; and round its sides the flagelliform, bulbiferous spikes issue. *Stem* none. *Leaves* petioled, peltate, cordate, entire, acute, smooth on both sides; posterior lobes obtuse; from four to twelve inches long, and from three to eight broad. *Spikes* or *runners* from the body of the tuberous root, some simple, leafless III. shoots issue, they are about as thick as a quill, run for a few inches, just under the surface 497 of the earth, and there strike root, after which they rise from six to twelve inches nearly erect, and bear numerous, appproximate fascicles of small, sessile, scaly, proliferous bulbs. *Bulbs* oblong, green, the size of a small berberry, vegetating readily when committed to the earth; when they chance to remain any length of time on the spike, other bulbs are formed in the axills of the scales, the whole forming a little round head of these bulbs. *Scales* (of the bulbs) imbricated, ovate, each ending in a pretty long, hooked bristle, by which they readily adhere to whatever touches them, and thereby are widely spread.

4. A. *rapiforme. R.*

Herbaceous, stemless. *Roots* tuberous, turnip-shaped. *Leaves* cordate, sub-repand. *Spadix* nearly as long as the concave spathe. *Anthers* many-celled.

A native of Pegu, introduced by the Rev. Mr. F. Carey, into the Botanic garden, where it blossoms during the rains. It differs from A. *montanum*, the only species known to me, for which it can be mistaken, most conspicuously in the shape and nature of the root; in other respects their size and habit are much alike.

5. A. *montanum. R.*

Stemless. *Root* a sub-cylindric tuber. *Leaves* cordate, repand, polished. *Spadix* nearly as long as the cucullate, coloured spathe. *Anthers* many-celled.

A native of the mountainous forest of the Northern Circars, where its root is said to be employed to poison tigers.

I long considered this to be A. *macrorhizon*, but changed my opinion on observing that Forster, who must have seen and examined that species in its recent state, says, the florets are hermaphrodite; there being six sessile, twin anthers surrounding each germ, and that the stigma is orbicular. There are no traces of stamina, anthers or glands round the germs of my III. plant; and the stigma is regularly three or four-lobed. In short, a very perfect *Arum*, or *Cala-* 498 *dium* according to Ventenat.

6. A. *Indicum. Lour. Cochin Ch.* 655.

Caulescent, erect. *Leaves* cordate, base bifid; *lobes* approximate and rounded. *Spadix* cylindric, equalling the linear, boat-shaped, spathe. *Club* cylindric, longer than the rest of the spadix.

Beng. Man-Kuchoo.

Man-guri, a variety with the petioles of the leaves darker coloured.

A native of various parts of South Asia. In Bengal it is much cultivated about the huts of the natives, for its esculent stems, and small pendulous bulbs, or tubers, these being very generally eaten by people of all ranks, in their curries, &c. Flowering time the close of the rains, and beginning of the cool season.

Root fibrous, with numerous suckers intermixed, particularly near the surface of the soil, these end in little solid, edible bulbs, by which the plant is most readily and abundantly multiplied; numerous, thick, fleshy, radical fibres also issue from all the lower part of the stems. *Stems* from one to two feet in circumference, simple, various in length according to age, but are rarely found more than a foot, or eighteen inches to the leaves, as they are seldom suffered to attain to their full size, which from what I have seen, and the information I have been able to obtain, may be from six to eight feet. *Leaves* on erect, long petioles, cordate, bifid at the base, with the lobes approximated, and rounded; *apex* also rounded, with a bent down, dagger-shaped point, smooth on both sides; *margin* waved; from two to three feet long, strongly marked, underneath an elevated whitish rib, and simple veins of the same colour. *Petioles* the length of, or longer than the leaves, smooth, the lower part sheathing, the upper round and tapering a little, transversely clouded, particularly the variety called Man-guri. *Flowers* III. axillary and always in pairs, large, though rarely so much elevated as the petioles of the leaves, 499 almost inodorous, and the little smell they have is rather offensive. *Bractes* a large, loose sheath embracing each of the sub-cylindric, smooth scapes. *Spathes* linear, before expansion sub-cylindric, a little gibbous at the base, smooth on both sides, of a pale greenish yellow, obtuse, or almost truncate, with a small subulate acumen; from eight to twelve inches long. *Spadix* cylindric,

Page Carey Ed. the length of the spathe, the cylindric part rather obtuse, pale yellow. *Club*, or *neuter* part, longer than all below it. *Anthers* numerous, occupying about two inches of the spadix between the club and germs, sessile with from eight to twelve polliniferous cells round the sides, which open rather under the apex on the outside. *Germs* numerous round the conic base of the spadix, ovate, one-celled, containing several ovula attached to the bottom of the cell. *Styles* none. *Stigma* three or four-lobed, yellow.

There is a variety of this stately useful plant distinguished from the one figured, by being of rather a darker colour, particularly the petioles. These are both propagated by the little pendulous bulbs, or tubers; and rarely produce ripe seed.

7. A. *odorum. R.*

Caulescent. *Leaves* cordate; *base* bifid; *lobes* rounded. *Flowers* in axillary pairs. *Spadix* equalling the cymbiform spathe, club one third the length of the whole spadix. *Berries* one-seeded.

From Pegu this most stately species of *Arum Caladium* of Ventenat, was sent by the Rev. Mr. Felix Carey, to the Botanic garden at Calcutta, where it thrives luxuriantly, and blossoms from the close of the rains till January, ripening its seed in March and April. The flowers possess a considerable degree of fragrance which to most people is agreeable, a rare quality in

III. the flowers of an Indian *Arum.*

500 *Root* consisting of long, far spreading, fleshy fibres. In this I have not found any of the small bulbs so common in A. *Indicum*, which this species resembles so much. *Stem* simple, straight, as thick as a man's arm, height of the stem in two years about two feet, marked with the circular cicatrices of the fallen leaves; height of the whole plant, to the top of the leaves, from six to eight feet. *Leaves*, cauline petioled, ovate, cordate, cloven at the base; *apex* obtuse with an incurved point, lobes rounded; *margins* somewhat waved, polished on both sides; *rib* and *vein* large and elevated underneath; from two to four feet long, by two or three broad. *Petioles* from two to three feet long, the lower half sheathing; the upper part sub-cylindric, smooth, polished, of an uniform green in every part. *Peduncles* axillary, intermixed with some spathiform bractes, nearly round, rather shorter than the petioles, one-flowered, regularly two in each axill. *Spathe* erect, the lower part thick, gibbous, convolute and permanent; the exterior portion boat-shaped with a short acute apex, both sides smooth and of a pale green colour, this portion drops soon after flowering time, while the lower portion remains till the seeds are ripe. *Spadix* nearly as long as the spathe, sub-cylindric, club about one third part the length of the whole spadix. *Nectaries*, many flat, rhombiform glands on the contracted part of the spadix, between the germ and the spadix. *Anthers* numerous, rhombiform, with ten or twelve polliniferous ones round the margin cells, these open by a slit on the outside of their apices. *Germs* numerous on the conic base of the spadix, four-celled, with two or three ovula in each attached to the bottom of the cell. *Style* none. *Stigma* roundish. *Berry* numerous, size of a small cherry, shape more or less round according to the number of seeds, smooth, of a shining scarlet, one-celled, the growth of the seeds having destroyed every vestige of the partitions which were present in the germ. *Seeds* generally from one to four, roundish, smooth. *Integument* single, in the recent state soft and spongy. *Perisperm* conform to the seed, cartilaginous. *Embryo* simple, obconical, with the obtuse end close to the apex of the seed and there not covered by

III. the perisperm.

501 8. A. *cucullatum. Lourier. Cochin. Ch.* 656.

Caulescent, ramous. *Leaves* sub-peltate, exactly cordate, acute, with the lobes exquisitely rounded and convex, or concave, from their margins being contracted. *Scape* half the length of the petioles. *Spadix* cylindric, nearly as long as the cymbiform spathe.

A native of Bengal, but rare about Calcutta; some plants in a good soil, in the Botanic garden have in seven years acquired numerous divided stems, from one to two feet in length; those on the outside are in general so much bent outward, as to rest on the ground.

Leaves long-petioled, somewhat peltate, exactly cordate, pointed, entire, and very smooth on both sides; with large prominent nerves underneath; *lobes* perfectly semi-circular, concave, from the margins being much contracted, the whole leaf from six to twelve inches long. *Petioles* sheathing for a little way near the base, the rest perfectly round, tapering, and of a uniform green colour; the whole length from one to three feet. *Scapes* axillary, scarcely half the length of the petioles, round, tapering, like the petioles. *Spathe* convolute, fleshy, and green at the base, above open, boat-shaped, and yellow. *Spadix* shorter than the spathe, cylindric, except the short club, which tapers a little to an obtuse point. *Filaments* none. *Anthers* as in *Caladium*, composed of from eight to ten, sub-cylindric, polliniferous cells, arranged round a spongy centre, each perforated at the apex to let the pollen pass. *Germs* in this species very indistinct.

9. A. *fornicatum. R.*

Caulescent. *Leaves* peltate, narrow-cordate, with the lobes angle-rounded. *Spadix* clavate; *upper* half of the *spathe* vaulted, equalling the spadix. *Berries* with from one to three seeds.

Kucheree of the inhabitants of Chittagong; it is called Bees Kuchoo about Calcutta.

III. A native of Bengal and Chittagong, where it blossoms during the rainy season.

502 *Root* fibrous. *Stem* erect or ascending, from one to three feet in length, marked with cicatrices of the fallen leaves, four or five inches in circumference, the height of the whole plant from three to six feet. *Leaves* from the apex of the stem, petioled, narrow cordate, peltate, acute-pointed; *lobes* angular, with the angles rounded, margins a little waved, smooth, of a shining green on both sides; from eight to twelve inches long, by six or eight broad. *Petioles* sheathing at the base, the rest round, smooth, clouded, and tapering, length various.

Scape axillary, shorter than the petioles, round, smooth, tapering, and clouded like the petioles. *Spathe*, the lower part permanent, ovate, fleshy, and closely enveloping the germs; the *upper portion* expands into an oblong, pale greenish vault, crowned with a subulate point, smooth on both sides, this portion is deciduous with that portion of the spadix which is above the germs. *Spadix* clavate, rather, if any, shorter than the spathe. *Anthers* numerous, occupying a large portion of the spadix immediately above the nectarial glands, each consisting of eight or twelve small, sub-cylindric cells forming angles on the sides; these contain the pollen and have each a small perforation at the apex for its exit. *Germs* many, round the base of the spadix only. *Nectarial filaments* no other than some variously shaped compressed glands round the contracted part of the spadix, between the anthers and germs. *Berries* numerous, with generally from one to three seeds in each. Page Carey Ed.

I do not find that this species is employed as an article of diet, but it is, I am told, used medicinally.

10. A. *flagelliformis. R.*

Stemless. *Leaves* sagittate; *lobes* spreading. *Spathe* and *spadix* equal, whip-shaped. *Nectarial scales* coloured. *Anthers* two-lobed, two-celled.

A native of Bengal, where it is found on damp, shaded, pasture ground. Flowering time the rainy season. III. 503

11. A. *divaricatum. Willd.* iv. 482.

Stemless. *Leaves* cordate-acuminate. *Spathe* longer than the subulate spadix, with a slender, drooping, spiral apex. *Nectarial filaments* simple, subulate and incurved.

Nelen Schena major. *Rheed. Mal.* xi. *t.* 20.

From Canton in China Mr. William Kerr sent this plant to the Botanic garden at Calcutta, where it blossoms freely during the rains, the leaves are not exactly as in Rheed's *Malabaricus*, yet to me they seem the same, or varieties of one species.

Root a small, hooked tuber, with many fibres from its union with the rest of the plant. *Stem* none. *Leaves* radical, petioled, oblong sagittate, acuminate; *margins* waved, smooth on both sides; *lobes* divaricate, but little, and rather obtuse; from four to six inches long, by two or three broad. *Petioles* nearly as long as the leaves. *Scapes* solitary, axillary, much shorter than the petioles. *Spathe* longer than the spadix, recurvate, toward the base campanulate, beyond the middle tapering into a long, slender, drooping, spiral point; of a deep beautiful crimson on the inside; on the outside ferruginous, green. *Spadix* nearly erect. *Club* subulate, acute, the colour of the inside of the spathe. *Stamens; filaments* none. *Anthers* a few near the base of the club, and nearly an inch above, a crowded tuft of simple, subulate, incurved, nectarial filaments, two-lobed; *lobes* grooved on the outside, and open on the apex. *Germs* few and occupying a short space of the base of the spadix, just under the nectarial filaments, one-celled, and containing a single ovulum, attached to the bottom of the cell. *Styles* none. *Stigma* flat.

12. A. *orixensis. Roxb.*

Stemless, *Leaves* three-lobed. *Flowers* sub-sessile. *Spathe* ample, erect, longer than the spadix. *Nectarial filaments* long, and often ramous.

Beng. Ghekool.

Arum trilobatum. *Lourier. Cochin Ch.* 534. III

Teling. Surei Kunda. 504

A native of the shady mango groves, near Samulkota, where the soil is pretty dry, and fertile. Flowering time the beginning of the rains.

Root perennial, tuberous, nearly round, the size of a pullet's egg, white, with small inequalities, many fibres issue from the apex, round the insertion of the leaves, and flower; stemless. *Leaves* radical, petioled, deeply three-lobed; *lobes* ovate, pointed, a little scolloped, smooth, round the under side, parallel with the margins and near it runs a double nerve about eight or ten inches broad, and the same length. *Petioles* erect, round, tapering, striated, about twelve inches long at the base, vaginated, and embracing one another. *Scape* axillary, very short, just sufficiently long to elevate the spathe above the ground. *Spathe* shorter than the petioles, striated, erect; the inside red; the outside herbaceous green. *Spadix*, the base surrounded with the germs, crowned with many, yellow, ramous filaments; the middle swelled with the anthers, above them there is no second order of filaments. *Club* scarlet coloured, as long as all the rest of the spadix, erect, tapering, subulate, from a concave broad base, to a point which is neither obtuse nor sharp.

Note. This seems to me to differ from *divaricatum* and *trilobatum.* From the former in having deeply three-lobed, pointed leaves, and excessively acrid roots; and from the latter not only on account of the different form of the leaves, but because here the spathe is erect, with a straight point; there drooping, with the long point twisted like a screw; here are also ramous fibres growing on the germs.

The roots (when fresh) are exceedingly acrid, more so than those of A. *Dracunculus*, or *maculatum.* The natives apply them in cataplasms, to discuss or bring forward scirrhous tumours. They also apply them externally to the bite of venomous snakes, at the same time giving inwardly about the size of a field bean. III.

It is certainly a most powerful stimulant, in proper hands it might no doubt be used to great advantage in the cure of several disorders. 505

13. A. *trilobatum. Willd.* iv. 483.

Stemless. *Leaves* three-lobed. *Flowers* sub-sessile. *Spathe* ample, with its apex spiral, and resting on the earth. *Nectarial filaments* short, simple and recurved.

Arisarum Amboinicum. *Rumph. Amb.* v. *t.* 110. *f.* 2.

Page Carey Ed.

The roots came accidentally from the Moluccas, amongst the earth that some other plants were brought in, for the Botanic garden. Flowering time in the Botanic garden, the beginning of winter.

Root tuberous. *Stem* none. *Leaves* radical, the most exterior ones deeply three-lobed, almost ternate, the interior ones triangular, all are smooth on both sides; from four to six inches long, and nearly the same in breadth. *Petioles* near the leaf sub-triangular, below sheathing, smooth, about as long as the leaves. *Scape* from the centre of the leaves, very short. *Spathe* rather longer than the spadix, spreading horizontally with its twisted apex resting on the ground. *Nectarial filaments* recurved, short, and simple. *Germs* on a conical receptacle, the base of the spadix being so formed.

In *Arum orixensis*, which this plant looks like, the receptacle of the germs is cylindrical, with a long ramous filament, crowning its upper edge, this alone is a sufficient distinguishing mark.

14. A. *gracilis. R.*

Stemless. *Leaves* deeply three-parted, or sub-ternate; *lobes* acute; the middle one oblong, lateral, semi-hastate. *spathe* flagelliform, the length of the flagelliform spadix. *Nectarial filaments* simple, and revolute.

Katu-schena. *Rheed. Mal.* xi. *t.* 21.

A native of Silhet, where it is known by the name *Harpung*, and used medicinally. Flowering time the hot and the rainy seasons.

III. 506

SECT. II. *With compound Leaves.*

15. A. *cuspidatum. R.*

Stemless. *Leaves* ternate; *leaflets* equal, lanceolate, cuspidate. *Scapes* as long as the petioles. *Spathe* longer than the subulate pointed spadix. *Anthers* from four to five, in a peltate circular crown on each filament.

A native of Pulo Pinang, where Mr. W. Roxburgh first discovered this uncommonly fine species, and sent the roots to the Botanic garden where the plant blossoms in April.

Root, a small, tuberous, perennial crown, with long fleshy fibres from its base. *Stem* no other than the lower sheathing portion of the petioles of the leaves, and about three or four inches long. *Leaves* few, petioled, ternate. *Leaflets*, the pair sub-sessile, and semi-lanceolate, the terminal one petiolated, and lanceolate, all ending in long, filiform points, and perfectly smooth on both sides; *margins* entire, but waved, from four to twelve inches long, and from one to three broad. *Scapes* solitary, from the centre of the leaves, about as long, and much like the fine, round, tapering, smooth, beautifully crowded portion of the petioles of the leaves. *Spathe* oblong, the lower half sub-cylindric, faintly clouded, at the base converging; above expanding, pale green and incurved; *apex* filiform. *Spadix* shorter, the spathe, lower half cylindric, and surrounded with stamens; upper half subulate and naked. *Corol* none. *Stamens* numerous; *filaments* very short, thick, and fleshy. *Anthers* generally four, round the apex of each filament. *Pistils*, none can be found on the only plant now in blossom.

16. A. *curvatum. Roxb.*

Stemless. *Leaves* pedate; *leaflets* from ten to twelve, lanceolar. *Spathe* vaulted, half the length of the curved spadix; no nectarial filaments. *Anthers* three-lobed.

Nap. Beer-bauka.

III. 507

A native of Nepal. In the Company's Botanic garden it blossoms in May.

Roots tuberous. *Leaves* radical, two or three, pedate; *segments* from ten to twelve, lanceolar, entire, smooth, veined; about six inches long. *Petioles* very long, the lower four fifths thereof sheathing; the upper part round, tapering, all are smooth, and of a pale green colour, below the petioles are embraced by a sheath or two, these are clouded with white on the outside. *Scape* from three to four feet high, which is rather longer than the leaves, round, smooth, and all but a portion of its apex enveloped in the sheaths of the leaves. *Spathe* half the length of the spadix, its body which embraces the receptacle or flower-bearing part of the spadix, cylindric, above that the remaining part of the spathe projects horizontally over the mouth of the cylindric part, like a large, concave, pointed roof, or lid, striated, otherwise smooth, and of an uniform pale green on both sides. *Spadix* the receptacle may be about a fourth of the whole, it is erect, above that it bends out downwards, then upwards, ending in a long, erect, naked club, or rather whip. *Stamens* occupying the upper two thirds of the receptacle. *Filaments* short, diverging. *Anthers* large, three-lobed, with two polliniferous pits in each lobe. *Germs* numerous, &c. as in the genus.

17. A. *sessiliflorum. Roxb.*

Stemless. *Leaves* pedate; *leaflets* about nine, broad-lanceolate, entire. *Flowers* sessile, appearing when the plant is destitute of foliage. *Spathe* revolute, twice the length of the long, tapering, erect, acute spadix. *Nectarial filaments* clavate. *Anthers* two-lobed. *Berries* from one to two-seeded.

A native of the country about Cawnpore, from thence introduced by Colonel Hardwicke into the Botanic garden in January 1803, where the plants blossom freely during the dry, hot season.

III. 508

Root of the shape and size of a small turnip, with small knobs, or offsets, growing from it, of a light brown. *Leaves*, which appear many weeks after the flowers decay, pedate and about two feet high. *Leaflets* generally nine, broad-lanceolate, entire, smooth, from three to nine inches long. *Petioles* round, smooth, tapering, clouded with pale dull purple; from six to eighteen inches long. *Scape* very short, and entirely hid under the surface of the earth. *Spathe*

sessile, indeed its gibbous base is rather immersed in the earth, for four or five inches above the swelling, erect, cylindric and entire; then reclinate, and open, the edges variously dentate, somewhat curled, more deeply coloured, and soon becoming involute. *Spadix* scarcely half the length of the spathe, deeply coloured at the base, conical, and there covered with germs. *Nectarial filaments* clavate, crowning the germs; from thence two-lobed, two-celled, sessile. *Anthers* naked, cylindric, occupying about two inches. *Club* straight, from six to eight inches long, highly coloured, slender and acute. *Germs* obovate, one-celled, containing two ovula, attached to the bottom of the cell. *Berries* turbinate, smooth, polished, crimson, one or two-seeded. Page Carey Ed.

18. A. *lyratum. Roxb.*

Root turnip-shaped, stemless. *Leaves* compound; *first divisions* sub-ternate; *leaflets* lyrate, smooth.

Teling. Udavee-Kundee.

Grows in moist places amongst the Circar mountains.

Root tuberous, pretty smooth, and something like a large potato. *Leaves* radical, one, two, or three, petioled, tripinnatifid; *divisions* very unequal; the *exterior* ones compound, larger than the others, pointed, and obliquely oblong, sometimes scolloped, smooth; the *inferior* ones small, and obtuse. *Petioles* one or two feet long, striated, clouded, swelled at the base; and there sheathing. *Berries* the size of a small cherry, red, smooth, one-seeded.

The roots are eaten by the natives of the mountains, but require two or three boilings and some particular care in the dressing to render them inoffensive, and nourishing. III.

19. A. *campanulatum. Roxb.* 509

Stemless. *Leaves* decompound. *Flowers* sessile, with respect to the surface of the ground, and appearing when the plant is destitute of leaves. *Spathe* the length of the spadix, campanulate, with curled margins, no nectary; *club* broad-ovate, lobate. *Anthers* two-celled.

Sans. Kunda or Kulla.

Teling. Manchi kunda.

Beng. Ol.

Tacca sativa, *Rumph. Amb.* v. *p.* 324. *t.* 112, the root and leaf, and Tacca phallifera, *t.* 113. *f.* 2. the flower, at which period not a leaf is to be found. Schena and Mulen-Schena. *Rheed. Mal. p.* 11. *t.* 18, and 19.

Found wild in damp places in the woods near Calcutta; flowering time the beginning of the rains.

Root perennial, tuberous, roundish, covered with a dark brown skin, frequently, when in a good soil, as large as a child's head; from various parts of the chief root, there issue small tuberosities, which are employed as offsets, to cultivate the plant by. *Leaves* radical, for the most part only one or two, thrice-bifid; *divisions* outwardly pinnatifid; *segments* obliquely oblong, pointed, smooth; size very unequal; the *exterior* one being always longer than the inferior one, the whole leaf is from one to three feet each way. *Petioles* round, tapering, with darker coloured green, pretty smooth, clouded as long as the leaves. *Spathe* very large, leathery, campanulate; the *border* curled; smooth on both sides; the *outside* near the base pale green; the *middle part* deeper green, and towards the margin greenish purple; the *bottom* deep dotted purple; the *spadix* about as long as the spathe, the lower third or pistiliferous part cylindric; the middle third or staminiferous portion somewhat turbinated, the club or upper third part very broad, short, conical, or sub-globular, of a dark purple colour, variously lobate, and wrinkled like a dried truffle, in large plants this part is six inches in diameter, and four in perpendicular height. *Filaments* none. *Anthers* numerous, closely impacted round the turbinate or middle portion of the spadix, linear, two-celled, with two corresponding openings at the apex, at which to discharge the disk or pollen; the immense quantity thereof that spews out from these openings and drops down in the pistils, is really inconceivable. *Nectarial filaments* none. *Germs* numerous, roundish; *styles* subulate, thick-coloured; *stigmas* large, yellow, downy, two-lobed. *Berries* numerous, long, obovate, red and covered with a considerable portion of pulp. *Seeds* one or two in each berry. III. 510

This species is much cultivated in the Northern Circars, and highly esteemed for the wholesomeness, and nourishing quality of the roots. It deserves to be called the *Telinga potato.* The usual time of cultivation is immediately after the first rains, in June. A very rich loose soil suits it best; where the swelling of the root meets with little obstruction, and where they draw the greatest nourishment, for which reason it requires to be very well, and repeatedly ploughed. The small tuberosities that are found in the larger roots, are what they employ for sets, and are planted in the manner potatoes are in England, and about the same distance from one another. In twelve months they are reckoned fit to be taken up for use. The larger roots will then weigh, if the soil has been good, and the season favourable, from four to eight or more pounds each, they keep well if they are kept dry, and are by the natives employed as food, in the same manner as the common yam.

20. A. *bulbiferum. Roxb.*

Root tuberous, stemless. *Leaves* decompound; *bulb*-bearing. *Spathe* cauled, rather longer than the cylindric spadix, no nectaries.

Beng. Umla bela.

A native of Bengal, and plentiful in the woods in the vicinity of Calcutta, where it blossoms in May, at which time nothing more of the plant is to be seen than the inflorescence; soon after the decay of the flowers, the leaves make their appearance, and continue during the rainy season. III. 511

Root perennial, turnip-shaped, and about the same size with fleshy fibres from every

Page Carey Ed. part, particularly the crown. *Stem* none. *Leaves* radical, generally single, long-petioled, commonly divided into three, petioled, once or twice dichotomous, pinnatifid, though in stunted plants they are frequently trigeminate. *Leaflets* broad-lanceolar, acute, entire, smooth, the breadth of the whole leaf is often four feet; small, compressed, round bulbs are almost always present on the upper side of the divisions of the leaves. *Petioles* from one to four feet long, round, smooth, clouded, tapering a little towards the top. *Scape* erect, from the crown of the root, round, smooth, about six inches long, beautifully clouded with olive, and pale orange tinged with pink. *Spathe* cauled, ovate when taken off and spread, smooth on both sides; at the base on the outside clouded like the scape; above and on the inside pink. *Spathe* cylindric, nearly the length of the spadix, club obtuse, and about one third of the whole, buff-coloured. *Filament* none. *Anthers* two-celled. *Nectaries* none, nor any intermediate space between the stamens and pistils. *Germs* roundish, two-celled, one of which even in the germ is for the most part abortive, the other contains one curved ovulum, attached to the bottom of the cell. *Style* scarcely any. *Stigma* four-lobed. *Berries* one-seeded.

21. A. *sylvaticum. Roxb.*

Leaves super-decompound: *leaflets* lanceolate. *Spadix* straight, two or three times longer than the short, gibbous campanulate spathe. *Anthers* two-celled.

Teling. Udavee chaina.

A native of the mountainous parts of the Circars. Flowering time the wet season.

Root perennial, tuberous, nearly smooth like a potato. *Stem* none. *Leaves* radical, one
III. or two, petioled, thrice two or more lobed; *lobes* pinnatifid; *segments* lanceolate, smooth.
512 The whole leaf is from eighteen to thirty inches each way. *Petioles* erect, from one to two feet long, smooth, clouded. *Petioles* winged. *Scape* erect, round, the length of the petioles, smooth. *Spathe* one third the length of the spadix, opening at, and near the apex only. *Club* thrice the length of the rest of the spathe, tapering to a long subulate point. *Stamens* numerous, occupying about two inches of the spadix, just within the apex of the spathe, singly sessile, and roundish, with two polliniferous cells, which open on the apex. *Nectary*, some smooth, irregular, glandular bodies are placed between the stamens and germs. *Germs* numerous, globular, surrounding an inch of the base of the spadix, they have the rudiments of three ovula. *Style* very short. *Stigma* large, three-lobed, glutinous, yellow. *Berries* one, two or three-seeded.

Note. Roots brought from the mountains grew and flowered in my garden at Samulkota, but it is perfectly unknown to the natives of the low country. I am therefore ignorant of its uses.

22. A. *margaritifer. Roxb.*

Herbaceous, stemless. *Leaves* trifid, with entire, narrow-lanceolate, pinnatifid segments. *Spathe* campanulate, equalling the obtuse spadix; *nectaries* like large pearls.

A native of Hindoostan, from thence introduced into the Botanic garden, where it flowers in May, and June, sometimes before the leaves appear.

Root a roundish, solid tuber, which produces roundish offsets in every part; size various; six inches in diameter. *Leaves* decompound; *segments* narrow, lanceolate, entire, acuminate. *Scape* straight, erect, cylindric, as thick as a man's thumb, and about two feet long, variegated, with deeper and lighter green. *Base* embraced by one, two, or three withering sheaths.
III. *Spathes* sub-campanulate, obtuse, the length of the spadix, smooth; the prevailing colour a
513 pale greenish yellow, with the bottom of the bell dark purple. *Spadix* cylindric, obtuse, every part occupied. *Anthers* obovate, two-celled, with gaping slits at top, occupying nearly the upper half of the spadix, to its very apex. *Nectaries* solid, obovate, smooth, pearl white, occupying about one fourth of the middle of the spadix, between the anthers, and germs, as if studded with large pearls. *Germ* ovate, two-celled, with one ovulum in each, attached to the lower and inner angle of its cell. *Style* short. *Stigmas* large, round, with a small division at top; clammy, yellow.

CALLA. Schreb. gen. N. 1388.

Spathe one-leaved. *Spadix* covered with florets. *Calyx* none. *Corol* none. *Berries* many-seeded.

1. C. *aromatica. R.*

Caulescent. *Leaves* sub-sagittate, cordate, acuminate; *lobes* rounded and divaricate. *Spadix* cylindric, obtuse, equalling the spathe; above male, below female, with abortive stamina intermixed; *anthers* many-celled.

Cuchoo-gundubee, is the vernacular name in Chittagong, where it is indigenous. In the Botanic garden it is in flower the whole year. When cut it diffuses a pleasant aromatic scent, something like that of the *scitamineous* tribe; the medicinal virtues of the root are in high estimation amongst the natives, and they sell from ten to sixteen rupees the maund.

Root, the body or tuber is a continuation of the stem when the plants are old enough to have one, invested in the old withered sheaths of the leaves, with numerous, long, white, fibrous cords issuing from every part. *Stem* short and of a slow growth. *Leaves* radical, long petioled, shape between cordate and sagittate, acuminate, lucid; *lobes* rounded and rather remote from each other, general length about twelve inches, and little more than half of that
III. in breadth. *Petioles* with a sheathing base, and smooth, as in the order. *Flowers* many to-
514 gether from the axills and centre of the leaves, their whole length, scape included, scarcely half the length of the petioles, the usual bractes intervene between the round, smooth, uni-

form, green scape. *Spathe* sub-cylindric, rather obtuse, with an acumen, smooth on both sides, of a pale greenish yellow. *Spadix* sub-cylindric, obtuse, equalling, or rather longer than the spathe; the upper two thirds covered with sessile, many-celled anthers; the lower third with the germs intermixed with about as many abortive stamina as there are germs. *Germs* ovate, seemingly two, or three-celled, but as the receptacles are parietal and do not unite in the centre, I can call them only one-celled ovula, many attached to the exterior half of the parietal receptacles. *Style* none. *Stigma* two or three-lobed. *Berries* oblong, not unlike a large berberry, and rarely containing more than a single seed. Page Carey Ed.

Is readily multiplied, by offsets from the body of the root.

2. C. *calyptrata. Roxb.*

Stemless. *Leaves* oblong, cordate. *Spathe* circumcised, the upper conical portion falling when early in blossom. *Spadix*, the upper half clavate and covered with stamina, the lower half cylindric, and female.

Arisarum esculentum. *Rumph. Amb.* v. *t.* 111. *f.* 1.

A native of Amboyna, from thence introduced into the Botanic garden, where it blossoms in May.

Root a small, oblique, oblong tuber with ramous fibres. *Stem* none. *Leaves* oblong, cordate, smooth on both sides, subulate, pointed, with a single slender vein round the margin; from five to seven inches long, and about three broad. *Petioles* sub-cylindric, shorter than the leaves. *Scape* shorter than the sheathing portion of the petioles, which embrace it on opposite sides. *Spathe* a little longer than the spadix, at the base round the germs convolute and green; the upper portion separating and dropping from the lower, when the anthers begin to discharge their pollen, splitting round the base into various portions, is of a tender somewhat fleshy texture, a pale yellow colour, and smooth on both sides. *Spadix* with germs only round, the lower half a small portion at the middle contracted, and naked, above clavate and covered with anthers. *Filament* none. *Anthers* numerous, cuneate, with two polliniferous pores at top. *Germs* numerous, from two to four-lobed. *Style* none. *Stigma* glandular, scarcely elevated above the germs. III. 515

3. C. *rubescens. R.*

Caulescent. *Leaves* cordate, base bifid. *Spathe* contracted, acute, equalling the spadix. Lower third of the spadix covered with germs, and clavate corpuscles intermixed; the upper two-thirds covered with anthers only.

Dracunculus amboinicus. *Rumph. Amb.* v. *t.* 111. *f.* 2.

A native of Chittagong, and from thence sent to the Botanic garden at Calcutta by Dr. Buchanan, in 1797, where it blossoms in August 1801.

Root of numerous, long, fleshy, spreading fibres. *Stem*, the largest plant in the Botanic garden has in four years got one of about three inches in length only, and half that in diameter, and as yet surrounded with the withered, stem-clasping bases of the old leaves, through these pass the thick fleshy fibres of the root, which descend into the ground. *Leaves* many, horizontal, petioled, sagittate-cordate; *lobes* obtuse, margins very entire, and without the inner marginal vein common to most of this order, point acute; from six to twelve inches long, and from three to six broad, in general slightly tinged with red, particularly round the margins. *Petioles* erect, below deeply channelled and embracing those within, above tapering gently, and there very slightly channelled, smooth, of a deep dull red, from one to five feet long. *Scapes* in the single plant now before me, four issue from the axill of one leaf, they are more or less erect, round, coloured, smooth, somewhat clavate, from three to four inches long. *Spathe* coloured, lanceolate on both sides, opening a little above the middle; at all times closely shut except for a short space, and just before the pollen is discharged. *Spadix* scarcely longer than the spathe, sub-cylindric; the lower third covered with the germs, intermixed with small, white, clavate, stamen-like scales; the upper two thirds closely covered with sessile twin anthers. *Germs* round, three-celled, with the rudiments of many ovula in each. *Style* none. *Stigma* large, convex, obscurely three-lobed. III. 516

4. C. *oblongifolia. Roxb.*

Caulescent. *Leaves* erect, oblong. *Spathe* boat-shaped, acuminate, a few female below.

Arum aquaticum. *Rumph. Amb.* v. *t.* 108.

A native of the Moluccas, from thence brought to the Botanic garden at Calcutta, where it blossoms during the rains.

Root fibrous, perennial. *Stem* straight, in plants of four or five years' growth above a foot high, and an inch in diameter, marked with the cicatrices of the fallen leaves. *Leaves* terminal, erect, petioled, oblong or narrow cuneate-oblong, entire, smooth on both sides, from six to nine inches long, and about three broad. *Petioles* shorter than the leaves, the upper third nearly round. *Scapes* axillary, shorter than the petioles, round, smooth. *Spathe* oblong, boat-shaped, acute, pointed, smooth, of a deep green on both sides, gaping considerably. *Spadix* cylindric, rather shorter than the spathe, the lower third, or two fifths, with a few scattered pistils, the upper part closely covered with four-celled anthers. *Berry* globular, one-seeded.

5. C. *picta. R.*

Caulescent. *Leaves* short-petioled, ovate-oblong, entire, clouded. *Flowers* axillary, solitary, peduncled. *Spathe* gibbous, acuminate, shorter than the obtuse, clavate spadix.

A native of the Island of Sumatra; in the Botanic garden where it has been introduced, it blossoms about the close of the rains. In this the male part of the spadix is three or four times longer than the base or female part; anthers with two, two-lobed cells. The germs ovate, containing one ovulum only, attached to the bottom of the cell. III. 517

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6. C. *virosa*. *R.*

Caulescent. *Leaves* peltate, ovate, slightly waved, undivided at the base. *Spadix* one fourth the length of the subulate spathe, with the female florets at the base. *Anthers* many-celled.

Hind. Bish Kuchoo. Bish means poison; this species we may therefore conclude is at least reckoned so.

A short, large, waved plant of an uncommon appearance, the leaves being only undulate round the base, and therefore nearly destitute of that division into two large lobes so common to the simple leaved plants of this order. Flowering time toward the close of the rains.

Stem in our young plants in the Botanic garden short, simple, round, and considerably bent to one side. *Leaves* petioled, peltate, ovate, undivided at the base; the posterior margin undulate, from one to two feet long, and from six to fifteen inches broad. *Petioles* about the length of the leaves, base sheathing, the rest round and smooth, and the colour nearly an uniform green. *Scapes* axillary, many together, somewhat angular, half the length of the petioles, one-flowered. *Spathe* subulate, nearly straight, convolute, smooth, of a lively yellow; about four times longer than the spadix. *Spadix* about three inches long, obtuse; the lower third part covered with the female florets, and the upper two thirds with the male. *Anthers* peltate, from eight to twelve-celled round the margin. *Germs* broad-ovate, one-celled, containing many ovula attached to three or four parietal receptacles. *Style* scarcely any. *Stigma* large, peltate.

GNETUM. Schreb. gen. N. 1477.

III. 518 MALE. *Calyx* a cylindric ament with rotate, entire, many-flowered scales. *Perianth proper* or *corol* tubular, containing a single filament with a two-lobed anther. FEMALES above the males in the same scale of the ament. *Perianth proper* or *corol* urceolate. *Germ* superior, one-celled, ovula solitary, superior. *Style* short. *Stigma* trifid. *Drupe* one-seeded. *Embryo* inverse, with an ample perisperm.

1. G. *gnemon*. *Willd.* iv. 591.

Leaves opposite, elliptic; *aments* axillary, compound.

Gnemon domestica. *Rumph. Amb.* i. *t.* 71.

A native of Sumatra, and the Molucca Islands. Strong cords are made of the fibres of its bark, at Sumatra, and its leaves are used as spinage. In both male and female, the corol is very distinct, and of a pitcher shape, with a small perforation at top. they are separately surrounded with a number of slender, short filaments, which may be celled perianths.

2. G. *scandens*. *R.*

Shrubby, scandent. *Leaves* opposite, oblong.

Ula. *Rheed. Mal.* vii. *p.* 41. *t.* 22.

Gnemon funicularis. *Rumph. Amb.* v. *p.* 12. *t.* 7, and 8.

Nanu-witi, the vernacular name in the Silhet district. A stout scandent shrub, a native of the hilly parts of Chittagong, and the eastern parts of Bengal, as well of Malabar and the Moluccas. Flowering time in the former, March and April, fruit edible, ripening in September and October.

Young shoots round, smooth, jointed at the insertion of the leaves and there swelled. *Leaves* opposite, short-petioled, oblong, firm, glossy, entire, rather obtuse, about six inches long, by three broad. *Petioles* rather short, enlarged at the base on the inside. *Stipules* none. *Peduncles* axillary and terminal, generally one or two opposite pairs of peduncled cylindric aments and a terminal one; all are round and smooth. *Scales* of the aments short, cyathiform, forming a complete ring around the rachis at every eighth part of an inch, embracing a double
III. whorl of male and a single whorl of female florets, over them; the whole intermixed with much
519 brown hair. MALE FLORETS. *Perianth proper* or *corol* unequally ovate, with a minute perforation of the apex for the style and stigma to pass through. *Filaments* single, from the bottom of the tube of the perianth, ovate with a minute perforation at the apex for the style and stigma to pass through. *Germ* superior, hid in the perianth, lanceolate, one-celled. *Style* short. *Stigma* trifid. *Drupe* oblong, rather larger than the largest olive; when ripe smooth, and of a reddish orange colour, one-celled. *Pulp* intermixed with many tender spiculæ like those of Cowhage, yet said to be greedily eaten by the natives, where the plants grow. *Nut* conform to the drupe, rather tough, but thin and ribbed on the inside, and on the outside striated, one-celled, evalvular. *Seed* conform to the nut. *Integuments* two; the exterior one thin and fibrous; the inner one less distinct, and adhering to the perisperm very firmly. *Perisperm* conform to the seed, cartilaginous. *Embryo* in the apex of the perisperm, straight. *Cotyledons* two, ensiform, unequal. *Radicle* superior.

CASUARINA. Schreb. gen. N. 1395.

Male calyx an ament. *Corol* two-petalled, or two-parted. *Female calyx* an ament. *Corol* none. *Germ* one-celled, one-seeded; *attachment* inferior. *Style* two-cleft. *Strobile* two-valved, one-seeded. *Seeds* winged. *Embryo* inverse, with little or no perisperm.

C. *muricata*. *R.*

Dioecous, arboreous. *Branches* and *branchlets* scattered, horizontal; *strobiles* oval, murexed with the unarmed, sharp, conical points of the little capsules.

A native of the sand hills, on the sea side, in the province of Chittagong; and from thence was sent by Dr. Buchanan to the Botanic garden, where in the course of ten years

from the seed, they have grown to be trees of from sixty to eighty feet in height; with trunks three feet and a half in circumference four feet above ground, but in their native soil, the large trees are said to be nearly one hundred feet high, and nine or ten feet in circumference. The wood is not held in estimation, though of a reddish colour, and texture like *Cedrela Toona*. In the Botanic garden they blossom during the months of February and March.

Trunk straight up to the top of the trees, as in the Firs and Pines. *Bark* smooth, brown, and considerably cracked. *Branches* scattered, horizontal with apices ascending and the extreme twigs often drooping. *Leaves* or rather extreme filiform division of the branchlets verticelled, though frequently not more than one or two in the vertical, that is from the same annular stipule, slightly furrowed, simple, or ramous, jointed, with joints ending in a six to eight-cleft cup, in which the next joint sits. *Stipules*, for so I will call the six to eight-cleft, annular, woolly ring that surrounds the branchlets and embraces the insertion of the leaves, or small slender branchlets and the peduncles. MALE. *Aments* cylindric, terminating the leaves. *Scales* from [illegible] to eight in a vertical and united at the base, they are pointed and woolly. *Flowers* as many as there are divisions in the vertical. *Corol*, two opposite, boat-shaped, ciliate [illegible] opposite to each divis of the vertical. *Filaments* single, twice as long as the vertical. *Anthers* two-lobed. FEMALE FLOWERS, on a different tree; at least trees now seventy feet high, that have been annually in flower these ten years have not produced any other, and issue solitarily with the leaves, from the six or eight-cleft, annular stipules. *Aments* oval, short-peduncled. *Scales* from six to eight, at the base united into a vertical, with a single flower in each. *Corol* none. *Germ* oblong; *style* the entire part very short, soon dividing into two long, recurved, bright, garnet-coloured portions. *Stigmas* simple. *Strobiles* oval, about the size and shape of a nutmeg, armed with the sharp conic points of the two-valved capsules. *Seeds* small, with a large, wedge-shaped, membranaceous wing.

III. 521

ARTOCARPUS. Schreb. gen. N. 1393.

Male and *Female florets* on the interior surface of different receptacles. *Male proper perianth* from two to three-leaved. *Corollets* none. *Females proper perianth* one-valved. *Corollets* none. *Germ* one-celled, one-seeded; *attachment* superior. *Style* single. *Fruit* compound. *Embryo* without perisperm.

1. A. *hirsuta. Lamarck. Encycl.* iii. 201.

Leaves entire, ovate. *Stipules* [illegible]. *Male aments* cylindric and pendulous. *Female* globular and erect.

Artocarpus pubescens. Willd. iv. 198.

Ansjeli. *Rheed. Mal.* iii. *t.* 32.

Angelee is the name it is known by amongst the natives in the vicinity of Tellicherry.

A native of the forests of Malabar, where it is common and grows to be a tree of great magnitude, and its timber is used for various economical purposes. Mr. Dyer, the surgeon at Tellicherry, who sent me specimens in flower gathered in February, says it is chiefly hewn out to make fishing boats as mentioned by Van Rheede.

Young shoots hirsute. *Leaves* alternate, petioled, oval, entire, [illegible] somewhat hairy underneath, particularly the large parallel veins, from six to seven inches long, and from four to five broad. *Petioles* short, hirsute. *Stipules* lanceolate, hairy on the outside. *Aments* in pairs, axillary or from the axills of the former year's leaves; *male* long, slender and pendulous; *female* round, long-peduncled and erect. *Bracts* or chaffy scales linear, obtuse and mixed amongst the male florets. *Male perianth* one-leaved, sub-cylindric; *mouth* two-parted. *Corol* none. *Filaments* single, the length of the calyx. *Anthers* two-lobed. *Female perianth* one-valved; the lower third part of the whole length firmly united to each other, the other two thirds daggered; nearly solid, there being only a slender perforation through its centre for the style, armed on the outside with short stiff bristles. *Corol* none. *Germ* ovate, one-celled, containing one ovulum attached to the top of the cell. *Style* longer than the calyx, filiform. *Stigmas* simple, acute. *Fruit* compound, each of the size of a very large lemon, armed with numerous hispid spines, on the enlarged end are still more indurated points of what I called the perianth. (See above.) Internal parts and arrangement as in the common *Jak. Sitodium cauliflorum, Gært. sem.* i. 345. *t.* 71. and 72. *Seeds* many, ovate or oval, the size of a field bean. *Integuments* two, the exterior one thin like parchment; the interior one thicker, dark brown, and spongy. *Perisperm* none. *Embryo* with two equal cotyledons, and minute body lodged close to the umbilicus at the smaller end of the seed. III. 522

2. A. *integrifolia. Willd.* iv. 184.

Leaves oblong, entire. *Flowers* cauline.

Sitodium *cauliflorum. Gært. Sem.* i. 345. *t.* 71, 72.

Sans. and *Teling.* Punusa.

Tsjaca marum. *Rheed. Mal.* iii. *t.* 26, 27, 28.

Beng. Kanthal.

Jak tree.

Polypheuna *Jaca. Lourier. Cochin Ch.* 667.

It is [illegible] throughout Southern India, and all the warmer parts of Asia; where it is wild or originally from, I know not. On the coast of Coromandel, it does not in general attain to any great height, from thirty to forty feet may be reckoned a high tree, but with a very large ramous [illegible], finely head, particularly when it stands detached from other trees, and is about [illegible] high, flowering [illegible] the cold season, fruit ripe in four or five months afterwards.

Leaves alternate, petioled, oval, in young luxuriant plants often lobed, of a firm leathery
III. texture, above of a deep smooth shining green, below less so, about four inches long. *Petioles*
523 short, slightly channelled. *Stipules* two broad-lanceolate, pretty smooth, embracing like a spathe the next inner leaf and ament when present, falling as soon as they begin to expand. MALE FLOWERS. *Ament* single, short-peduncled, the size of a man's thumb, or more; generally on small, recent branchlets which issue from the trunk and larger branches, every where most closely covered with the small sessile corollets. *Spathe* no other than the above mentioned stipules. *Perianth proper*, or *corol* two-leaved; *leaflets* wedge-formed, equal, a little hairy. *Stamens, filament* single, thick, club-shaped, rather larger than the perianth. *Anthers* two-lobed; *lobes* oval, and grooved in the middle. FEMALE FLOWERS on the same tree, and mixed with the male on the same branchlets. *Calyx; spathe*, no other than the male has, viz. the stipules. *Ament* oblong, closely covered with innumerable, small, sessile germs, perforated at the apex for the style to pass. *Germs* numerous, their exterior coverings uniting near the base; above they are from four to six-angled, and throughout solid, except where the germ proper and style is lodged. *Germ proper*, ovate, lodged in the bottom of the last described covering. *Style* single, rather longer than the envelope of the germ. *Stigma* single, recurved, clubbed, grooved on the outside. *Fruit* compound, oblong, murexed, from twelve to thirty inches long, from six to twelve in diameter, weighing from ten to sixty pounds. *Seeds* reniform, one in each germ, were all to come to maturity, which never can happen; they are about the size of a nutmeg, enveloped in a thin, smooth, leathery sheath, lodged within the fleshy eatable part of the fruit, which formed the exterior coverings of the germ, already noticed.

For a more particular account of the fruit, see *Gærtner on Seeds, vol.* i. *page* 344. 346. *tab.* 71. and 72. all that is intended by this description, is to give a tolerable idea of the parts of fructification.

The fruit of this tree is so universally known, that it is unnecessary for me to say any
III. thing respecting its excellence, as well as that the seeds, when roasted, are not inferior to the
524 best *chesnuts*. In Ceylon, where the tree grows most plentifully, and where the fruit attains to its greatest size, the inhabitants make them a very considerable article of their diet.

The wood comes near to mahogany in appearance, and is much used for making furniture, in Ceylon and some other parts of India.

The Indians of those parts prepare their best bird-lime from the tenaceous white juice, which abounds in all the uneatable parts of the fruit, and in the young tender parts of the tree. It flows freely from recent wounds.

3. A. *Lakoocha. Roxb.*

Leaves entire, oval. *Aments* axillary, globular. *Fruit* nearly round, somewhat lobate, and almost smooth.

Sans. Lukoocha.

Beng. Dhca-phul-Burhul.

Found in the gardens in the vicinity of Calcutta, and is common all over Bengal. *Leaves* deciduous during the cold season, appearing again with the flowers in March about the beginning of the hot season.

It is so far as I have seen, a tree of a middling size, with a short but thick trunk, and a very large spreading head.

Bark of the trunk very rough; that of the young parts pretty smooth. *Leaves* about the extremities of the branchlets alternate, short-petioled, somewhat bifarious, oval, entire, generally pointed, smooth above, downy beneath, with many parallel veins, and beautifully reticulated between them, from four to twelve inches long, and from two to six broad. *Stipules* small, cordate, caducous. *Aments* axillary, being from the axills, or most exterior germs, of last year's leaves; the male are below, the female on the same branchlets, but from different axills. MALE FLOWERS. *Calyx; spathe* no other than one, or two, small, stipule-like scales, embracing the insertion of the spadix. *Aments* sub-sessile, irregularly roundish, about the size
III. of a nutmeg, every where covered with innumerable florets, internally of a beautiful rose-
525 colour. *Perianth proper*, or *corol*, consisting of small, wedge-shaped, truncated scales. I find it difficult to assign any determined number to each stamen, from two to four is most common. *Filaments* rather longer than the scales of the calyx, tapering from the base. *Anthers* round, minute, elevated a very little above the surface of the spadix. FEMALE FLOWERS. *Calyx; spathe* as in the male. *Ament* short-peduncled, globular. *Perianth proper*, as in A. *integrifolia*. *Germs* numerous, of the shape of a Florence flask; *style* the length of the exterior coat of the germ. *Stigmas* subulate. *Fruit* compound, the surface pretty smooth; the internal structure as in the genus, about the size of a man's fist or larger, and generally of an irregular, roundish form, when ripe yellow. *Seeds* oblong, involved in the same number of integuments as in A. *integrifolia*.

The natives eat the fruit; to an European the taste will generally be found disagreeable. The male spadix is acid, and astringent; the natives eat them in their curries. The roots dye yellow. The whole tree and unripe fruit, like A. *incisus*, and *integrifolia*, contain much tenaceous milky juice.

4. A. *Chaplasha. Roxb.*

Leaves in the adult, obovate, entire; in the young pinnatifid. *Aments* axillary, long-peduncled, sub-rotund. *Fruit* spherical.

Beng. Chaplash.

A native of the eastern frontier of the Province of Bengal, about Tipperah, and Chittagong, where it grows to be a tree of the first magnitude. Flowering time March and April, when the first flowers appear, the tree is destitute of leaves, but they make their appearance

before the fruit is formed.

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Trunk straight; *branches* numerous, ascending. *Bark* tolerably smooth, of a dark [illegible]. *Leaves* alternate on short, round, pubescent petioles, [illegible] frequently, lobed generally, pinnatifid; in grown trees oval or obovate, cuneate, with the margins somewhat remotely dentate-serrate, or undulated, of a thick, firm, harsh texture; from six to twelve inches long, and from four to eight broad. *Stipules* two, spathiform, within the leaves, opposite, caducous. *Aments*, the first that appear are immediately below the germs, which contain the new swelling foliage; afterwards when the leaves begin to expand they are axillary, both male and female are long-pedunculed, and nearly round. *Male aments* [illegible]. *Calyx*, *amental* long-pedunculed, [illegible] of the size of a [illegible] innumerable, very minute florets, [illegible] with the [illegible] petals. *Perianth proper*; scales two, ovate, [illegible] with their [illegible] *Corol* none. *Filaments* one or two, rather longer than the *corol*. *Anthers* twin. *Female aments* amongst the male. *Calyx*; *ament* long-pedunculed, spherical, entirely covered with innumerable florets, intermixed with small peltate scales, as in the male. *Perianth proper*, one-leaved, clavate, fleshy, with a small perforation for the style to pass through. *Corol* none. *Stamina* none. *Germ* ovate. *Style* slender. *Stigma* curved, and just projecting without the apex of the perianth. *Fruit* compound, perfectly round, drooping on its long peduncle, about the size of a very large cherry, and much like [illegible] [illegible] smaller. *Seeds* numerous, oblong, white, and about the size of *Pistachio* nuts. III. 525

It differs widely in many respects from *Artocarpus Lakoocha*. First, chiefly in the appearance of the trees; for this is tall and straight, growing to an immense size, of which canoes are made on the *Ventoor* and *Gomooree* rivers. The wood is also serviceable for various other purposes, and is reckoned superior to almost every other sort, particularly when employed under water; that being short, very ramous, and generally crooked. Secondly, here both male and female aments, and consequently the fruit, are long-pedunculed; there very short. Thirdly, here the fruit is spherical; there of an irregular, lobate shape. III. 527

5. *F. echinata. Roxb.*

Leaves oblong, entire. *Male* and *female aments* round. *Fruit* spherical, echinated.

Tampóne of the Malays of Malacca.

A native of Prince of Wales' Island, and other parts east of the Bay of Bengal, where it grows to be a moderate sized tree, and the fruit is eaten by the natives.

Trunk in a young tree in the Botanic garden at Calcutta, short, stout, and straight. *Branches* numerous in every direction, forming a dense, sub-globular head. *Bark* of the old [illegible] of a dark [illegible] and of the [illegible] [illegible] [illegible] brownish hairs. *Leaves* alternate, short-petioled, oblong, entire, obtuse, hard, with the upper surface glossy, and the lower one lighter coloured and harsh, from six to eight inches long, and from three to six broad. *Stipules* lanceolate, concave, harsh with short, appressed hairs. *Male aments* axillary, short-pedunculed, globular, of the size of a gooseberry, yellow. *Bractes*, a few, clavate-peltate, intermixed with the corollets. *Calyx* one-leaved, bifid segments oblong, obtuse. *Filaments* single, rather longer than the calyx. *Anthers* sub-rotund. *Female aments* terminal, [illegible] pedunculed, globular. *Fruit* compound, round, of the size of a small [illegible] [illegible] [illegible]

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2. F. *hirsuta. Roxb.*

Arboreous. *Tender parts* hirsute. *Leaves* round-cordate, from three to five-lobed, serrate-dentate; *lobes* acute. *Fruit* axillary, paired, sessile, oval, shaggy.

Dungra, the vernacular name in the Silhet district, where the tree is indigenous, and pro-
III. duces fruit during the dry season.
529 *Young shoots* sub-succulent, and very hairy; *hairs* fulvous. *Leaves* alternate, petioled round-cordate, from three to five-lobed, serrate-dentate, hairy, particularly the nerves underneath; *lobes* acuminate; length and breadth from six to ten inches. *Stipules* lanceolate. *Fruit (receptacle,)* in pairs, axillary, sessile, round, an inch and a half in diameter, very hairy, of a rich yellow, fleshy; *flesh* firm and yellow. *Umbilicus* scaly and scarcely elevated above the surface of the fruit. *Calyx* of the fruit; *leaflets* three, obliquely round, cordate, cuspidate, sericeous on the outside. *Male corollets* a few, just within the umbilicus, sub-sessile. *Calyx* three-leaved, or deeply three-parted; *leaflets* oblong, deep red. *Filaments* generally two, short. *Anther* linear-oblong. *Female corollets* numerous, long-peduncled, occupying the whole of the cavity of the receptacle. *Calyx* as in the male. *Germ* sub-globular. *Style* on one side, short. *Stigma* large, somewhat three-lobed.

The fruit is eaten by the natives of Silhet, where the tree is indigenous.

3. F. *palmata. R.*

Leaves palmate, woolly underneath; *lobes* serrulate dentate, and cuspidate.

Found by Dr. W. Hunter indigenous at Pulo Pinang.

4. F. *caricoides. Roxb.*

Sub-arboreous. *Leaves* cordate, crenate, villous. *Fruit* axillary, solitary, or paired, peduncled, trigonal-turbinate, wrinkled. *Umbilicus* shut with three cordate scales. *Calyx* from five to six-leaved.

From General Martin at Lucknow, some plants were received into the Botanic garden where they grow readily from cuttings, thrive well, and bear fruit abundantly.

III. *Stem* erect. *Branches* ascending, having much the appearance of those of the common
530 fig, only running more into long slender twigs. *Leaves* alternate, petioled, cordate, crenulate, villous; from six to ten inches long. *Petioles* round, downy, two or three inches long. *Fruit* axillary, long-peduncled, solitary, erect, of a triangular-turbinate shape, with a round, closed, prominent umbilicus; wrinkled on the outside, and somewhat villous; when ripe yellowish, and about the size of a gooseberry. *Calyx* of the fruit three-leaved, that of the corollets five-leaved, as in the genus.

Note. The plant has so much the general habit of F. *Carica,* that I long considered it an accidental variety, but as the tree is less like it when old, and the shape of the leaves continues constant, I am now induced to consider it a distinct species. The fruit is tough, and very unpalatable, in short not eatable.

5. F. *virgata. R.*

Shrubby. *Leaves* broad-cordate, obtuse, serrate-crenate, three-nerved, downy. *Fruit* axillary and lateral, peduncled, solitary, oval, smooth.

A native of Rohilcund; flowering time the dry season.

Trunk tolerably erect. *Branches* few, weak, ascending, covered with smooth, brownish, ash-coloured bark; the whole height of plants six years old, from four to eight feet. *Leaves* alternate, petioled, broad-cordate, three-nerved, obtuse, serrate-crenate, very downy underneath; from three to four inches long, by three broad. *Petioles* round, downy, about two inches long. *Stipules* semi-lanceolate, caducous. *Fruit* axillary, solitary, ovate, of the size of a pea, yellow, pretty smooth, supported on round, downy peduncles, rather less than an inch long. *Calyx common,* three-leaved, and removed a little from the fruit, by a short pedicel. MALE. *Corol* round the inside of the mouth of the fruit, long-pedicelled. *Calyx* of from three to five, lanceolate, hairy leaflets. *Stamina* three. *Female corollets* numerous, sub-sessile. *Calyx* gener-
III. ally three-leaved. *Germ* round. *Style* hairy, tapering to a fine, hairy, coloured stigma.
531 6. F. *hirta. R.*

Arboreous. *Tender parts* very hairy. *Leaves* long-petioled, cordate, ciliate, serrate. *Fruit* axillary, paired, sessile, ovate, shaggy.

Bun or Khura Doomoor, of the natives Silhet, where the tree is indigenous, and grows to a great size, and is beautiful during the dry season.

Young shoots rather succulent, and very hairy; *hair* fulvous. *Leaves* alternate, long-petioled, cordate, acutely serrate, from three to five-nerved, sometimes somewhat angular, or obscurely lobed; the upper surface a little hairy, very downy underneath, particularly the nerves, a foot long, by nine or ten inches broad. *Petioles* very shaggy, round, from six to eight inches long. *Stipules* lanceolate, sericeous. *Fruit* axillary, sessile, ovate, hirsute, of the size of a pigeon's egg, one or two calycine-like cuspidate scales near the base. *Calyx* three-leaved; *leaflets* obliquely cordate, acuminate. *Male corollets* a few round the mouth of the receptacle, diandrous, with a red, five-cleft calyx. *Female corollets* numerous, over the whole of the inside of the receptacle, long-pedicelled. *Calyx* three-leaved, or three-parted; *parts* lanceolate, and coloured as in the male. *Germ* oval. *Style* the length of the germ. *Stigma* bifid.

7. F. *squamosa. R.*

Shrubby. *Leaves* alternate, short-petioled, turbinate, very scabrous; *stipules* permanent. *Fruit* solitary, or in pairs, short-peduncled, turbinate, very scabrous, some large scales about the apex.

Found by Mr. Gott indigenous in Rohilcund.

8. F. *laminosa. Hardw.*

Shrubby, spreading. *Leaves* opposite, broad-lanceolate, scabrous. *Fruit* globular, ribbed,

and imbricated with lamina.

Chan cheree of the inhabitants of the mountains near Chinnalee, where Colonel Hardwicke found it growing in moist situations, and spreading over the rocks. See *Asiat. Res.* vi. *p.* 379. 532

9. F. *heterophylla.*

Shrubby, sub-scandent. *Leaves* variously divided, scabrous. *Fruit* axillary, paired, peduncled, rough.

Valli teregam. *Rheed. Mal.* iii. *t.* 62.

Beng. Ghoti-suara.

Teling. Buroni.

A weak, straggling, shrubby species, a native of thickets, &c. on the banks of rivers, and water courses, where its roots are constantly moist.

Stems long, woody, weak, supporting themselves amongst bushes. *Bark* scabrous, rust-coloured. *Leaves* alternate, short-petioled, oval or oblong, sometimes entire, but more frequently divided into almost every form that can be imagined, very scabrous, with the divisions often toothed. *Fruit* axillary, paired, peduncled, round-turbinate, of the size of a large gooseberry, when ripe yellow, with whitish, scabrous spots. *Calyx* of the fruit minute, three-parted.

The bark of the root is very bitter, it is given by the Hindoos of these parts to remove pains in the bowels.

This is truly a polymorphous plant, and I suspect Vahl's *Ficus denticulata, truncata,* and *serrata,* as well as Willdenow's *aquatica,* and probably Loureiro's *cannabina,* are nothing more than varieties of this species; at least I have never met with any other that can be compared with them, and this varies so much, even on the same plant, as to agree with them all.

10. F. *scabrella. R.*

Shrubby, scandent. *Leaves* alternate, short-petioled, oblong, remotely serrulate-dentate, scabrous. *Fruit* axillary, solitary, peduncled, turbinate, tubercled, of the size of an olive, scales of the umbilicus ciliate. III.

Bullum Doomoor, the vernacular name in Chittagong, where it is indigenous, and the fruit eaten by the natives in their curries. It is an extensive rambling species, depending on other plants for support, but does not root on them, as some nearly allied species do. 533

Leaves alternate, short-petioled, oblong, remotely serrate, or a compound of that and scollop-dentate, very harsh to the feel, from two to five inches long, and from one to two broad. *Fruit* axillary, peduncled; two is the habit, but rarely more than one grows to half the full size, which is that of a large olive, turbinate, rough with spongy, brownish tubercles, or knobs; when ripe the ground colour is yellow. *Umbilicus* clavate and shut with ciliate scales. *Calyx* of the fruit rather remote from it, and three-lobed. *Male corollets,* a few round the mouth of the umbilicus, monandrous, with from three to four-cleft perianths. *Female corollets* numerous over the whole of the smooth inside of the receptacle, with a perianth like that of the male.

11. F. *fructicosa. R.*

Shrubby. *Leaves* petioled, sub-ovate, entire, void of pubescence, but harsh. *Fruit* in axillary pairs, rather long peduncled, round.

Parkut Doomoor, the vernacular name in Chittagong, where it is indigenous, and grows to the size of a bushy, spreading shrub of about five or six feet in height, but shows no tendency to climb, or ramble, like some other nearly allied species, natives of the same country and the adjoining provinces.

Young shoots void of pubescence, but harsh with minute points, scarcely visible to the naked eye. *Leaves* short-petioled, alternate, ovate, rather obtuse, entire, and like the young shoots somewhat harsh to the feel; from three to four inches long, by from one and a half to two and a half broad. *Fruit* in axillary pairs, rather long peduncled, round, pretty smooth, the size of a small cherry, of a deep orange. *Umbilicus* flat and shut with a few, smooth III. scales. *Calyx* of the fruit rather remote, small and three-lobed. *Male corollets* many and 534 mixed among the female, diandrous, with a three-parted red perianth. *Female corollets* with the perianth like the male, the stigma two-toothed.

12. F. *Luducca. Roxb.*

Shrubby, very ramous. *Leaves* short-petioled, ovate, acute, entire, firm. *Fruit* axillary, solitary, short-peduncled, round, hairy.

Luduka, and Debree of the natives of Dosa, where Colonel Hardwicke found it on his journey to Shreenagur.

13. F. *Chincha. R.*

Shrubby. *Leaves* petioled, oblong, obtusely cuspidate, entire, scabrous. *Fruit* axillary, sub-sessile, round, scabrous, with an elevated umbilicus.

Chincha of the natives about Dosa, where it was found by Colonel Hardwicke on his journey to Shreenagur.

14. F. *quercifolia. Roxb.*

Perennial, creeping. *Leaves* reflected, oblong, irregularly sinuate, scabrous underneath. *Fruit* solitary, peduncled, short-oval, of the size of a pea.

A native of the Island of Sumatra, and sent to the Botanic garden by Dr. Charles Campbell, from Bencoolen. It bears fruit all the year.

Stems none. *Branches* creeping to the extent of about two feet, round and pretty smooth. *Leaves* alternate, petioled, reflected, oblong, deeply, and irregularly sinuate, scabrous, particularly underneath, from one to three inches long, and about half that in breadth. *Petioles*

Page Carey Ed. III. 535 short, somewhat channelled. *Stipules* tapering, coloured, caducous. *Fruit* axillary, solitary, peduncled, short-oval, warty, the size of a pea. *Umbilicus* elevated, large, coloured, and nearly shut with scales. *Perianth* no other than two, or three, remote small scales on the peduncle and fruit. *Corollets* many; the *female* ones below, a few diandrous; the *hermaphrodite* ones just within the umbilicus. *Perianth* in both five-cleft.

15. F. *humile. Roxb.*

Perennial, creeping. *Leaves* short-petioled, oblong, remotely dentate-serrate, harsh, obtusely acuminate. *Fruit* paired, peduncled, oblong with an elevated umbilicus.

From Sumatra, where it is indigenous, this small cespitose species has been introduced into the Botanic garden where it produces fruit the whole year. It is like F. *quercifolia* in habit, and I at first considered it to be only a variety of that species; but a longer and more intimate acquaintance with both, induces me to think them distinct. In this I have found only female florets.

Stems and *branches* spreading flat on the ground, and striking root, round and pretty smooth, the most tender luxuriant shoots somewhat three-sided. *Leaves* alternate, short-petioled, shape between oblong-ventricose and rhomboidal; *apex* alternate, but obtuse, margin remotely serrate-dentate; both surfaces void of pubescence, but harsh, from two to four inches long. *Petioles* and *veins* red. *Stipules* ensiform, coloured, smooth. *Fruit* axillary, paired, peduncled, of the size of a pea, oblong, with a large elevated umbilicus. *Corollets* entirely female in all the plants brought to this garden. *Calyx* five-parted; *segments* ensiform.

16. F. *repens. Willd.* iv. 1149.

Somewhat shrubby, creeping. *Leaves* obliquely cordate, lobate, serrate-dentate. *Fruit* solitary, peduncled, long-obovate.

Beng. Bhooi-Doomoor.

A native of pasture ground, and borders of tanks about Calcutta.

III. 536 *Stems* creeping or diffuse, close on the ground, ramous, as thick as a quill; *young shoots* a little hairy. *Leaves* alternate, petioled, unequally cordate, often deeply sinuate, generally acutely and regularly serrate, the upper surface scabrous, underneath downy; size very various. *Petioles* about half the length of the leaves. *Stipules* opposite, and not dropping so soon as in the other species I have met with. *Fruit* axillary, solitary, peduncled, obovate, somewhat scabrous, scarcely the size of the point of the little finger. *Peduncle* bracted at the middle, or it may be called a three-leaved calyx, and then the fruit is pedicelled.

17. F. *radicans. R.*

Shrubby, scandent, and rooting. *Leaves* oblong, entire, long-linear, acuminate. *Fruit* globular, without a common calyx, long-peduncled. *Male corollets* monandrous.

Poora rooha the vernacular name in Silhet, where it is indigenous; it grows to be of a considerable extent, rooting upon old walls, various kinds of bushes and trees, like the ivy in Europe and the parasites in India, but has its main root generally though not always on the ground. In fruit the whole year.

Young shoots a little harsh to the feel, and green. *Leaves* alternate, petioled, oblong, entire, three-nerved; *apex* long, and very narrow, or ensiform like that of F. *religiosa*, hard and rather rough with reticulate veins underneath; lateral nerves small, springing from the base and running close to the margin; from three to six inches long, and from one to three broad. *Stipules* as in the genus, but small. *Fruit* paired or single from the base of the little branchlets, all axillary, long-peduncled, round, of the size of a black currant, when ripe, yellow or orange. *Calyx* of the receptacle none. *Proper perianth* in both male and female five-cleft; *segments* ensiform. *Male corollets* monandrous, a few round the inside of the mouth of the receptacle, all the rest female.

18. F. *scandens. R.*

Shrubby, scandent. *Leaves* short-petioled, ovate, entire, fruit in axillary pairs, round, III. peduncled; *common calyx* three-toothed.

537 A native of Silhet, where it grows to be a ramous climbing shrub, running up and over small trees, shrubs, &c.

Bark of the tender branchlets rather rough, and brown. *Leaves* very exactly ovate, short-petioled, entire, three-nerved, void of pubescence, but harsh to the feel, and very hard; from two to four inches long, and from one and a half to two and a half broad. *Fruit* in axillary pairs, all from the base of the small lateral branchlets, rather long-peduncled, round, rough, of the size of a black currant, and olive yellow when ripe. *Calyx* of the receptacle three-toothed. *Proper perianth* from three to five-parted in both male and female. *Male corollets* very few in some of the receptacles, in others none could be seen, monandrous.

19. F. *vagans. R.*

Shrubby, scandent, rooting to other trees. *Leaves* long-petioled, exactly cordate, villous underneath. *Fruit* axillary, peduncles solitary or in pairs, sub-globular, the size of a nutmeg; within hirsute.

A stout, woody, rambling species; a native of Chittagong, rooting on trees for support. It produces fruit at various periods through the year.

Young shoots smooth, except for a short while when they first appear, then a little hairy. *Leaves* alternate, long-petioled, exactly cordate, a little hairy underneath, of a hard texture, and rather harsh to the feel, entire, obtusely acuminate; about five inches long, by four broad. *Stipules* interfoliaceous, as in the genus. *Fruit* axillary, paired, is the habit, though one of the two is often wanting, long-peduncled, nearly round, about the size of a medlar. *Involucre* or *calyx* of the fruit three-lobed, and embracing its base. *Female corollets* only found, long-pedicelled, and intermixed with the long, stiff, tawny hairs, which line the inside of the

fruit, or receptacle. *Calyx* from four to five-leaved; *leaflets* lanceolate, acuminate. *Style* clavate. *Stigma* perforated.

20. F. *acuminata. R.*

Shrubby, scandent. *Leaves* short-petioled, lanceolar, entire, smooth, the apex long and ensiform. *Fruit* in axillary pairs, sub-sessile.

A native of Chittagong, where it runs over other trees, and emits roots, as it runs.

21. F. *hederacea. Roxb.*

Shrubby, scandent, rooting. *Leaves* ovate, smooth, but hard, fruit axillary, one or two, sub-sessile, round, the size of a cherry, and scarlet coloured.

Luta-Parkut Doomoor, the vernacular name in Chittagong, where it is indigenous in the forests, running up and over trees; and like the ivy emitting numerous small roots by which its very extensive ramifications are supported.

Bark of the woody parts dark brown, and rough; that of the *young shoots* harsh to the feel, but void of pubescence. *Leaves* alternate, short-petioled, ovate, entire, rather obtuse, smooth above, but rather rough underneath, and of a very hard texture; from three to five inches long, and two or three broad. *Fruit* in axillary pairs, though one of the two generally drops early, short-peduncled, round, the size of a large black currant, somewhat hispid, of a red orange approaching to scarlet. *Umbilicus* rather elevated, and shut with large, smooth scales. *Calyx* of the fruit appressed, and three-leaved; *leaflets* reniform. *Male corollets* sessile, and mixed among the female ones over the whole interior surface of the receptacle. *Perianth* three-leaved; *stamina* single. *Female corollets* pedicelled, with a three-parted perianth, and two-lobed stigma.

22. F. *Goolereea. R.*

Leaves opposite, obovate, serrate, downy. *Fruit* in axillary pairs, long-peduncled, nearly round, downy, with an elevated, scaly margin round the umbilicus.

Hind. Kuth-Goolureea.

23. F. *Wassa. R.*

Shrubby, straight. *Leaves* broad-lanceolate, often laciniate, sub-serrate, scabrous. *Fruit* axillary, peduncled, solitary, or paired, sub-rotund.

Wassa of the Malays, and probably *Caprificus aspera. Rumph. Amb.* iii. *t.* 94.

This small straight species was introduced into this garden, from the Moluccas, by Mr. Smith. The fruit appears during the hot season.

Stem straight, almost simple, from three to four feet high, covered with dark brown, pretty smooth bark. *Leaves* alternate, petioled, broad-lanceolate, frequently much and variously lanceolate and in that case broader than when entire, with the margins often serrulate, rough on both sides, and having two small lateral nerves near the base, with a green gland in the axill of each, from two to six inches long. *Petioles* about an inch long, slightly channelled. *Stipules* chaffy, sub-lanceolate, caducous. *Fruit* axillary, solitary or paired, peduncled, somewhat compressed into the shape of a turnip, smooth, the size of a gooseberry; *umbilicus* small and shut with scales. *Calyx* of the fruit none; of the peduncle or bractes obscure. *Florets*, nine tenths are female, the few male ones are round the umbilicus and mixed amongst the inner scales thereof.

24. F. *Indica. Amoen. Acad.* i. *p.* 27. Martyn's *ed. Mill. Dict. N.* 9.

Branches dropping roots, which become as long as the original trunk. *Leaves* ovate-cordate. *Fruit* in sessile, axillary pairs.

Sans. Vuta. See *Asiat. Res.* iv. 310.

Peralu. *Rheed. Mal.* i. *t.* 28.

Beng. Bur, or But.

Varinga latifolia. *Rumph. Amb.* iii. 127. *t.* 84. the figure very bad.

Cing. Bagha.

Teling. Marie.

Banyan tree.

An account of this immense, and most beautiful tree, is to be met with in almost every history of India.

It grows wild about the skirts of the Circar mountains, but in greatest perfection about, and in villages, where it is planted for the sake of its extensively cool, grateful shade; it is there the tree is found in its greatest perfection and beauty. Flowering time the hot season. I know of no other species of *Ficus*, which sends forth fibres from the branches, that descend to the ground, and become trunks.

Trunk; when young it is distinct, and single, at all times its form, thickness, and height very variable; still more so than that of F. *religiosa*, because generally reared from branches procured naked, and stuck in the ground. *Branches* spreading to a great extent, dropping capillary roots here and there, these enter the ground, as soon as they reach it, gradually becoming as large as, and similar to the parent trunk, by which means the extent becomes almost incredible, the height of the tree is at the same time slowly increasing, some I have seen fully five hundred yards in circumference round the extremities of the branches, and about one hundred feet high, the principal trunk of which might be more than twenty-five feet to the branches, and eight or nine in diameter, they are largest about the villages situate in fertile valleys amongst the mountains. The bark is smooth and of a light ash-colour. The wood light, white and porous. *Leaves* alternate, about the extremities of the branchlets, petioled, ovate-cordate, three-nerved, entire; sometimes the border is very slightly waved, when young very downy on both sides, when old, less so, particularly above; from five to six inches long, and from three to four broad, at the apex of the petiole on the under side, is a broad,

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smooth, greasy looking gland. *Petioles* a little compressed, from one to two inches long, downy. *Stipules* within the leaves, sheathing, downy, falling, leaving their annular marks on the branchlets. *Fruit* paired, axillary, sessile, when ripe the size and colour of a middle sized, red cherry, downy. *Calyx* of the fruit three-nerved.

Note. Fig. 1. of Plukenet's 178th Table is a much better figure of this tree than Fig. 4. of the same table.

The Bramins are partial to the leaves of this tree to make their plates to eat off; they are jointed together by inkles.

Bird-lime is prepared from the tenacious milky juice which every part of the tree yields in abundance on being wounded.

Birds eat the fruit, and the seeds grow the better for having passed through them; if they drop in the axle of the leaves of the Palmyra tree, (*Borassus flabelliformis*) they grow and extend their descending parts so as in time to embrace entirely the parent Palmyra, except its upper parts. In very old ones the top thereof is just seen issuing from the trunk of the Banyan as if it grew from thence, whereas it runs down through its centre and has its roots in the ground, the Palm being the oldest. For such the Hindoos entertain a religious veneration, saying it is a holy marriage instituted by Providence.

25. F. *elastica. Roxb.*

Leaves from oval to oblong, pointed, thick, firm and glossy. *Fruit* in axillary pairs, sessile, oval, smooth, the size of an olive. *Stipules* nearly as long as the leaves, smooth and rosy.

Kasmeer, the vernacular name by which this tree is known to the inhabitants of the Pundua, and *Juntipoor* mountains, which bound the province of Silhet on the north, where it is indigenous, and grows to the size of a full grown mango tree; that is fully as large as the great Maple, or Sycamore that grows in England. The season at which the young fruit appears, or at least when I procured it, was May and June; and they were ripe in August and September. Every part abounds with rich milky juice, which furnishes about one third of its weight of Caoutchouc. III. 542

Trunk erect, from five to six or more feet in circumference, and high in proportion. *Bark* as in most of the genus tolerably smooth, of a light ash-colour. The wood as in far the greatest number of our East Indian *Fici*, rather soft, porous, of a light brown colour, and appears to be fit for fuel, or charcoal only. *Branches* numerous, spreading and rising in every direction, forming a very extensive, and shady head; the bark of the largest ones is like that of the trunk, that of the young shoots smooth, polished, of a deep green.

The *Juntipoor* Raja who procured plants of this tree and branches in young fruit, says the tree from whence the latter were taken is only four years old and is twenty-five feet high, with a trunk three feet in circumference.

From the larger branches roots descend as in many of the Indian *Fici*.

Leaves permanent, alternate, petioled, from oval to oblong, perfectly entire, acute, smooth, and highly polished on both sides, with the upper surface deep clear green, and the under one paler, from four to twelve inches long, and from three to five broad, with numerous, fine, diverging veins, as in *Callophyllum inophyllum*. *Rib* smooth and deeply tinged with red. *Petioles* about an inch long, round and perfectly smooth. *Stipules* solitary, sheathing, before they burst sub-cylindric, and tapering to a fine point, every part smooth, on the outside of a deep rosy colour; within paler, they drop off at an early period, leaving a permanent annular mark behind, and are from four to eight inches long; I have not met with any other species with such a beautiful foliage, and stipule as in this. *Fruit* or *receptacle* in axillary pairs, sessile, just when they are relieved from the stipules each of them is inclosed in a double integument or involucre, which by the growth of the fruit soon bursts and disappears, leaving annular marks round the base of the fruit. When ripe oval and about the size of an olive, smooth, and of a greenish yellow colour. *Male* and *female corollets* intimately mixed over the whole of the inner surface of the fruit or receptacle. *Male calyx* three-parted; *segments* lanceolate. *Filaments* single and short. *Anthers* erect, clavate, obtuse. *Female calyx* as in the male. *Germ* unequally-oblong. *Style* from one side near the apex, curved. *Stigma* rather large, and ragged. III. 543

A similar substance to that which the milk of this noble tree furnishes in such abundance, so pliable, so elastic, and so capable of resisting menstrua, has been already described by me in the 5th volume of the *Asiatick Researches*. I there observed that inferior sorts were furnished by the milky juices of the Jak tree, *Artocarpus integrifolia*, the Banyan tree, *Ficus Indica*, and the Pippula tree, *Ficus religiosa*; since that time some other plants have been discovered in the countries immediately to the eastward of Bengal, such as a new species of *Willughbeia*, there called *Luti Am* or the scandent mango, another, a new and beautiful *Melodinus* or climbing apple, there called *Sadal Kowa*, which yields a milky fluid of the same nature, and to those I now add the above described Fig tree, which I consider an undescribed species, and to which I have given the specific name *elastica*, on account of its milky juice. The manner in which the discovery was made is as follows.

Towards the close of 1810, Mr. Matthew Richard Smith of Silhet, sent me a vessel, there called a Turong, filled with honey in the very state in which it had been brought from the Pundua or *Juntipoor* mountains north of Silhet. The vessel was a common, or rather coarse basket in the shape of a four-cornered, wide mouthed bottle, made of split ratans, several species of which grow in abundance amongst the above mentioned mountains, and contained about two gallons. Mr. Smith observed that the inside of the vessel, was smeared over with the juice of a tree, which grows on the mountains. I was therefore more anxious to examine the na-

ture of this lining than the quality of the honey. The Turong was therefore emptied and washed out, when to my gratification I found it very perfectly lined with a thin coat of *Caoutchouc.* Page Carey Ed. III.

The tree as above observed, grows to a large size and chiefly in the chasms of the rocks, on the declivities of the mountains, that time has filled with the decomposed rocks, and vegetables; I also find the young trees grow with the greatest luxuriance in the common soil of the Botanic garden. 544

Old trees are said to yield a richer juice than the young ones, at least, they say the juice of the latter remains much longer in its fluid undecomposed state, than that of the former. It is extracted by incisions across the bark down to the wood, at a distance of about a foot from one other, all round the trunk or branch, up to the top of the tree; and the higher the more abundant is the fluid said to be. After one operation, the same tree requires about a fortnight's rest, when it may be again repeated. During the cool season, from October until March, the juice is more scanty than in the warm weather, from March to October, but richer.

When this juice is exposed to the air, like milk when rennet is added to it, it separates spontaneously into the firm elastic substance itself, and a fœtid whey-coloured liquid. Fifty ounces of the pure milky juice taken from the trees in August yielded exactly fifteen ounces and a half of the clean washed *Caoutchouc.*

With this milk, while in its recent undecomposed state, the natives of the mountains, a most barbarous race as can be found in any part of the world, pay the inside of their rude utensils that are intended to hold fluids. The *Caoutchouc* itself being very inflamable, furnishes them with candles and flambeaux. They say they do not know of any mode by which it can be dissolved after it has acquired its firm state.

On reading Mr. Gough's description of a property of *Caoutchouc* in the 13th volume of *Nicholson's Journal, p.* 305, I was induced to try if this sort acquired heat by sudden extension and again lost it by contraction. His method was followed by suddenly extending a slip, and when it was applied to the lips I was sensible of an increase of heat, but could not perceive any diminution of that heat when the slip was suffered to return to its original state of contraction. I also applied the middle of two broad slips to the bulb of a thermometer, one on each side, so that the bulb was between them and found the mercury was raised two degrees, viz. from eighty, the temperature of the room where the experiment was made, to eighty-two, by a few quickly repeated extensions and contractions of the two slips; and as the bulb of the thermometer was placed in the middle of the slips, no friction upon it took place, consequently the increased temperature must be owing to another cause. III. 545

A thin slip twenty inches long, and half an inch broad, suspended in the sun-shine when the thermometer in the same place stood at 127, and kept straight by a light weight at its lower end, suffered no perceptible change; however it is likely that a nicer scale to measure any difference that might have taken place, would have detected some little change.

This substance, the produce of various other trees and vines, the most prominent of which are *Jatropha elastica. Linn. suppl.* 422. or *Siphonia Cahuchu. Willd.* iv. 567; the *Ule* tree or *Castilla elastica* of Cervantes the professor of Botany in Mexico, and *Urceola elastica. Asiat. Res.* v. 157. is already so well known as to render it unnecessary for me to enlarge on its qualities. I will therefore only add that this species of *Caoutchouc,* like that of *Urceola elastica,* is perfectly soluble in the essential oil obtained from the leaves of *Melaleuca Cajuputi,* commonly called *Cajuputi* oil.

26. F. *laccifera. R.*

Arboreous. *Leaves* long-petioled, from cordate to oval, obtuse-pointed, lucid, three-nerved. *Fruit* in axillary pairs, sessile, oval, smooth, scaly on the inside.

Kuthal But, the vernacular name of the tree in Silhet, where it is indigenous, and grows to as large a size, as F. *religiosa.* The fruit appears during the hot season and ripens in the rains.

Young shoots thick and smooth. *Leaves* alternate, petioled, from cordate to oval, obtuse, entire, three-nerved, firm and polished; from four to seven inches long, and from two to six broad. *Petioles* from one to two inches long, flattened, smooth. *Stipules* interfoliaceous, smooth, fine-pointed. *Fruit* axillary, sessile, oval, smooth, the size of a gooseberry. *Involucre,* or *calyx* of the fruit three-lobed. *Female corollets* only found. *Calyx* of four oblong leaflets scarcely longer than the germs. *Style* subulate. *Stigma* acute. III. 546

27. F. *sclerophylla. R.*

Leaves short-petioled, linear-oblong, hard and glossy, as are all the tender parts of the tree. *Fruit* in axillary pairs, short-peduncled, round, the size of a gooseberry, and yellow.

A large tree, a native of the forests of Chittagong.

28. F. *obtusifolia. R.*

Arboreous. *Leaves* alternate, short-petioled, from cuneiform, to linear-oblong, thick, hard and glossy. *Fruit* axillary, paired, or single, sessile, round, smooth, the size of a small gooseberry, and yellow.

A large elegant tree; a native of the forests of Chittagong, where it produces fruit during the hot and rainy seasons.

Young shoots polished, and marked with annular scars of the smooth, caducous, ash-coloured stipules. *Leaves* alternate, short-petioled, from linear-oblong to cuneiform, entire, obtuse, highly polished, and of a hard texture, about six inches long, and from two to two and a half broad. *Fruit* in axillary pairs, though one often fails, sessile round, smooth, the size of a small gooseberry, when ripe yellow; *umbilicus* rather sunk, and shut with a few smooth, large

Page Carey Ed. scales. *Calyx* of the fruit of three reniform glossy leaflets. *Male corollets* numerous, monandrous, and mixed amongst the sessile *female* ones through the whole of the inside of the receptacle; the perianth in both is three-leaved, the style in this species is remarkably long with a tapering, acute stigma.

III. 547 29. F. *ramentacea. R.*

Arboreous, branches dropping roots. *Leaves* long ovate-cordate, acute, entire, in the bud hirsute, when expanded, smooth, strongly marked with simple parallel veins. *Petioles* short and ramentaceous. *Fruit* in short-peduncled, axillary pairs, smooth, the size of a small cherry, and red.

A small tree, a native of Chittagong, where it produces fruit during the rains. In drying, the leaves become particularly glossy, while in the bud and until pretty well expanded, the large simple parallel veins are very hairy. From the branches roots descend as in F. *Indica*, and some other species, but never grow to any size as in *Indica*.

30. F. *religiosa. Willd.* iv. 1134.

Leaves cordate, scollop-waved, cuspidate. *Fruit* in axillary, sessile pairs, vertically compressed, smooth, black.

Arcalu. *Rheed. Mal.* i. *t.* 27.

Sans. Pippula. See *Asiat. Res.* iv. 309. also Bodhi-draoma, Chuladula, Koonjurashuna, Aswattha.

Beng. Aswat, or Asood.

Hind. Pippal.

Cing. Bogaha.

Teling. Rai.

This very large tree is common in every part of India. I have frequently met with it wild upon mountains, but it is most common near houses, where it is planted for the sake of the extensive, dark, grateful shade it yields. Flowering time the hot season.

Root spreading horizontally to a great extent, and very near the surface of the earth, often on it, from the soil having been washed away by rain. *Trunk* erect, in small trees round, when large and old it becomes full of inequalities, *i. e.* large perpendicular ridges and hollows, as if many trunks were united; its thickness is very various, the largest trees that I have seen were about twenty feet in circumference but short in proportion to that thickness, being

III. 548 rarely more than twenty or twenty-five feet to the branches. *Bark* pretty smooth, ash-coloured. *Branches* very numerous, spreading, and rising in every direction to a great distance and height. *Branchlets* often pendulous. *Leaves* alternate, petioled, pendulous, cordate, long, or slender, ensiform, pointed with the margins scollop-waved, both sides perfectly smooth, the upper one of a deep shining green, about six inches long, of which the narrow point occupies nearly two, deciduous during the cold season. *Petioles* round, smooth, long, very slender, whence the constant trembling of the leaves arising from the most gentle air of wind, as in the *aspen* tree *(Populus tremula.) Stipules* sheathing, caducous. *Fruit* paired, axillary, sessile, vertically compressed; when ripe of the size and colour of a small black cherry. *Calyx* of the fruit three-leaved.

Birds eat the fruit greedily. The wood like that of F. *Indica* is white, light, and soon perishes, of course it is not much used. Next to the mulberry leaves I have found silk worms like the young tender leaves of this tree. Much tenaceous milky juice is discharged from fresh wounds made in the bark.

31. F. *cordifolia. R.*

Leaves long, slender, petioled, ovate-cordate, waved, acuminate, glossy. *Fruit* paired, sessile, round, smooth, black.

Beng. Guy-aswut.

Arbor Conciliorum. *Rumph. Amb.* iii. *t.* 90.

Found in the vicinity of Calcutta, where it grows to be a large, very ramous, spreading tree. I never observed it on the Coromandel coast. Like F. *religiosa*, which it most resembles, the trunk is short; while young round and straight, but when old deeply furrowed, as if composed of many coalesced trunks.

Bark smooth. *Branches* spreading, seldom radicating. *Leaves* petioled, ovate-cordate,

III. 549 waved, most entire, fine pointed, smooth and shining on both sides, somewhat three-nerved, with the veins less numerous and less distinct than in F. *religiosa*. *Petioles* long, slender, nodding, giving to their leaves a tremulous motion with the least wind. *Stipules* as in the genus. *Fruit* paired, axillary, sessile, round, smooth, when ripe of the size and appearance of a black cherry. *Calyx* of the fruit three-leaved. *Navel* closed with three small scales.

Obs. It approaches nearest to F. *religiosa*, of any species I know, yet is easily to be distinguished from it by the leaves being narrower in proportion to the length, with much shorter points, and instead of the lobes forming a sinus at the base, there is a small degree of projection at the insertion of the petiole. And in the second place by the fruit being perfectly round, and not, as in *religiosa*, vertically compressed.

32. F. *Tsiela.*

Leaves long-petioled, ovate-oblong, acute, polished; *veins* parallel and simple. *Fruit* paired, axillary, sessile, round-turbinate.

Tsiela. *Rheed. Mal.* iii. *t.* 63. seems to be this tree.

Teling. Joovee, or Pedda-Joovee.

This next to F. *religiosa*, is the largest species I know. Its native station is the mountains, but it is also found every where on the low lands planted with F. *Indica* and *religiosa*, where it grows to be nearly as large, and is equally shady.

Bark smooth, greenish, no roots from the trunk, nor branches. *Leaves* alternate, petioled, somewhat three-nerved, ovate-oblong, pointed, most entire, firm, smooth on both sides, shining, particularly on the upper side, with numerous, simple and parallel veins, from four to six inches long, and from two to three broad. *Petioles* a little compressed, from one to two inches long. *Stipules* as in the other species, but in this they leave no durable cicatrice. *Fruit* paired, axillary, sessile, a little inclining to be turbinate, smooth, the size of a cherry, when ripe purple. *Calyx* of the fruit small, three-leaved. *Umbilicus* shut up with scales. Page Carey Ed.

Note. Plukenet's figure, referred to by Linnæus is good.

From wounds in the bark there issues a little, pale, glutinous, milky juice. III. 550

33. F. *Benjamina. Willd.* iv. 1143.

Leaves oval, and obovate, obtuse, polished. *Fruit* axillary, paired, smooth.

Itty-Alu. *Rheed. Mal.* i. *t.* 26.

Teling. Yerra *joovee.*

This is also a large tree, and a native of the Circar mountains.

Young shoots slender, perfectly smooth, as if polished. *Leaves* alternate, short-petioled, slightly three-nerved, obovate, entire, obtuse, firm, smooth, shining; *veins* numerous, alternate, parallel. *Petioles* many times shorter than the leaves, channelled, smooth. *Fruit*, axillary, sessile, paired, smooth, the size of a pea, when ripe purple with small yellowish specks; *umbilicus* even with the apex of the fruit, and shut up with scales. *Calyx* of the fruit, three-leaved.

34. F. *tomentosa. Willd.* iv. 1136.

Branches dropping small roots. *Leaves* oblong-cordate, pointed, very downy underneath. *Fruit* axillary, paired, sessile, woolly.

Teling. Petta mari.

A very large tree, a native of mountainous tracts; and like F. *Indica* gives out roots from its branches, though they do not grow large.

Young shoots woolly. *Leaves* alternate, petioled, oblong-cordate, slightly three-nerved, a little pointed, entire, on the upper side pretty smooth, on the lower one very downy, from four to six inches long; on the under side of the base of the middle nerve there is a large smooth, green gland, as in F. *Indica*. *Petioles* an inch long, channelled, woolly. *Stipules* as in the genus, but very woolly. *Fruit* axillary, paired, sessile, woolly, the size of a large pea, when ripe gray. *Calyx* very large, three-leaved; *leaflets* spreading, woolly.

Birds eat the fruit; the wood of this tree, as well as of all the preceding five species, is white, very light, and of little or no use, even for fuel. III. 551

35. F. *infectoria. Willd.* iv. 1137.

Leaves ovate-oblong, acute, waved, smooth. *Fruit* paired, axillary, sessile, round, smooth, white.

Placsha (Plucksha.) *Asiat. Res.* iv. 310.

Beng. Pakur.

Tsjakela. *Rheed. Mal.* iii. *t.* 64.

F. Tsjakela. *Burm. Fl. Ind.* 227.

A large and most beautiful tree with a far extended uncommonly dense head; a native of Bengal, I never met with it on the Coromandel coast. The trunk is large, and irregular like that of F. *religiosa*, sometimes dropping roots of considerable magnitude from the trunk and branches.

Bark pretty smooth, of a brownish ash-colour, very tough, and peeling off in long slips. *Leaves* alternate, petioled, oblong-cordate, pointed, waved, smooth on both sides, with few veins; from four to six inches long, and from two to four broad. *Stipules* about two inches long, slender, grooved, with a coloured gland round their apices. *Fruit* paired, axillary, sessile, the size of a pea, roundish, pretty smooth, when ripe white.

36. F. *rapiformis. Roxb.*

Arboreous, smooth. *Leaves* solitary and in pairs, petioled, oval, pointed, entire, a ring of scabrous specks below the insertion of the stipules. *Fruit* axillary, solitary, short-peduncled, turnip-shaped.

Introduced into the Botanic garden at Calcutta, from the Moluccas in 1798. In five years the young trees were from ten to twenty feet high, and produced fruit about the close of the rains, in September and October.

Trunk straight; *bark* ash-coloured and smooth. *Branches* many, spreading, the tender parts covered with smooth green bark. *Leaves* scattered, solitary, and also sometimes in pairs, petioled, of various shapes, but nearly oval and pointed is the most prevailing one, with the margins entire, smooth on both sides, from four to eight inches long, and about half that in breadth. *Petioles* about an inch only, flat on the upper side; a waxy gland on each side of their insertion. *Stipules* within the leaves, just below their insertion a ring of permanent scabrous dots surround the branchlet. *Fruit* axillary, solitary, short-peduncled, size of a small medlar, turnip-shaped, concave at both apex and base, dotted with small white scabrous specks. *Calyx* of the peduncle none; of the fruit two, or three-leaved; *leaflets* small, thick and glandulous. *Umbilicus* shut with numerous scales. III. 552

37. F. *excelsa. Vahl. en. pl.* ii. 195.

Arboreous, smooth. *Leaves* short-petioled, bifarious, obliquely-oblong, smooth. *Fruit* solitary or paired, peduncled, sub-turbinate. *Calyx* of the peduncle tridentate; *navel* round.

Atti mcer alou. *Rheed. Mal.* iii. *t.* 58.

Introduced from the Moluccas, into this garden. The fruit appears about the beginning of the rains.

Page Carey Ed.

Trunk and *branches* straight; as yet the trees are not more than ten or twelve feet high, and spread but little. *Bark* smooth, of a greenish ash-colour. *Leaves* alternate, bifarious, unequally oblong, sometimes pointed, entire, smooth above and slightly scabrous underneath, the middle nerve nearer the upper margin than the under one; about six inches long, and about three broad. *Fruit* axillary, solitary or paired, peduncled, nearly round, the size of a cherry, smooth, when ripe yellow. *Calyx* of the peduncle three-toothed, of the fruit none. *Umbilicus* small, round, shut on the inside with minute scarcely visible scales.

38. F. *comosa. Willd.* iv. 1148. *Corom. pl.* ii. *N.* 125.

Leaves oblong-ventricose, pointed, smooth. *Fruit* in pairs, generally terminal, turbinate, smooth, red.

Teling. Pootra-joovee.

III. 553 This is a pretty large tree, a native of the Circar mountains. It has a large spreading, very branchy shady top, the bark is pretty smooth, and ash-coloured, the branchlets are very slender, much sub-divided, and often pendulous.

Leaves alternate, petioled, oval, obliquely-pointed, entire, firm, smooth and shining, from two to four inches long. *Petioles* very slender, about an inch long, grooved. *Fruit* terminal, or in the exterior axills, paired, sessile, size of a gooseberry; *apex* depressed with the umbilicus rising a little in the centre, which is shut up with the scales; contracted at the base, something like the neck of a bottle, smooth, when ripe of a rich deep yellow colour. *Calyx* of the fruit three-leaved. *Proper perianth* of the male and female corollets, (there are no hermaphrodite that I could find) three-leaved; *leaflets* lanceolate. *Filaments* single. *Anthers* two-lobed. *Style* long, slender. *Stigma* filiform, two-cleft.

Note. I observed a hood over the rudiments of the young fruit, which fell off as soon as they began to increase in size.

39. F. *urticifolia. R.*

Leaves cordate, three-nerved, serrate, hispid above, downy underneath. *Fruit* in axillary pairs, long-peduncled, turbinate in a rather remote three-leaved calyx, downy, the size of a small gooseberry.

A native of the mountains north of Bengal.

40. F. *ampelos. Kön. Mss.*

Branches dropping fibrous roots. *Leaves* obliquely oval, scabrous. *Fruit* paired, axillary, pedicelled, pisiform, smooth, yellow.

Teling. Tella-barinka.

A large tree, a native of mountainous countries chiefly.

Trunk remarkably short, but very thick, and sometimes so completely ornamented with small, very leafy branchlets, as to hide it entirely; a most beautiful tree, thus embellished is to be seen at Ganjam. Top very large, spreading to a great distance; I have seen small pendulous, filiform roots, issuing from the larger branches. *Bark* smooth, ash-coloured with a dusky film. *Leaves* alternate, tending to be bifarious, spreading, short-petioled, obliquely oval, obtusely pointed, a little scolloped, scabrous, and very firm; generally about three or four inches long. *Petioles* short, curved, channelled. *Stipules* small, as in the rest of the family. *Fruit* axillary, paired, peduncled, when ripe the size of a pea, and yellow. *Calyx* of the fruit none, of the peduncles three-leaved, small. The leaves are used to polish ivory.

III. 554

41. F. *asperrima. Roxb.*

Leaves oval, often scolloped, very scabrous. *Fruit* axillary, paired, peduncled, round, downy.

Teregam. *Rheed. Mal.* iii. 60.

Teling. Karakar-booda.

A large tree, a native of moist valleys.

Trunk erect. *Branches* numerous, spreading into a large shady head. *Branchlets* rust-coloured, scabrous. *Leaves* alternate, about the extremities of the branchlets petioled, broad, oval, obtusely pointed, sometimes notched, and even lobate, very scabrous, a little wrinkled, three-nerved, from four to six inches long. *Petioles* about an inch long, scabrous. *Stipules* as in the family. *Fruit* axillary, paired, peduncled, downy, size of a gooseberry, when ripe yellow.

42. F. *tuberculata. R.*

Leaves short-petioled, oblong, entire, acute, rough. *Fruit* in pairs, peduncled, roundish, the size of a large pea, tubercled, the umbilicus elevated.

Teling. Kouda-joovee.

A native of the mountains of Coromandel, where it grows to be a small very ramous tree.

43. F. *angustifolia. R.*

Leaves sub-opposite, lanceolate, smooth, acute. *Fruit* axillary, paired, long-peduncled, turbinate, smooth.

III. 555 A large tree, a native of the Circar mountains.

Branchlets rust-coloured, but smooth. *Leaves* between alternate and opposite, short-petioled, most slightly three-nerved, broad-lanceolate, or oblong, sharp-pointed, smooth on both sides, entire; from four to eight inches long. *Stipules* as in the genus. *Fruit* axillary, paired, long-peduncled, turbinate, the size of a large pea, smooth; *umbilicus* elevated. *Calyx* of the fruit none, but there is a small three-scaled one at the base of the peduncle.

SECT. II. *Fruit fasicled, racemed, or panicled.*

44. F. *exasperata. R.*

Arboreous. *Leaves* short-petioled, oblong, acuminate, repand-serrate, rough on both sides.

Fruit axillary, solitary, or in pairs, peduncled, round, size of a pea. Page Carey Ed.

A native of the eastern parts of India and introduced into this garden in 1798. By the close of 1802, the trees were from twelve to fifteen feet high, with an erect trunk and branches; covered with rust-coloured, pretty smooth bark.

Young shoots scabrous. *Leaves* alternate, short-petioled, oblong, somewhat three-nerved, repand-serrate, acuminate, scabrous on both sides, so much so that they are fit to polish wood, and ivory with; from three to six inches long, and from one and a half to three broad. *Fruit* axillary, solitary or in pairs, peduncled, rough, the size of a small pea; *umbilicus* small, depressed, and shut with coloured scales.

Folium politorium, Rumph. Amb. iv. *t.* 63, agrees with the leaves of our oldest trees, and as they were brought from Amboyna, I conclude they are the same. Louriero's F. *politoria* is certainly different, for there is nothing like a spike to be found on our trees; besides Louriero describes his to be a shrub only. It ought, however, to be compared with F. *politoria. Willd.* iv. 1144.

45. F. *rotundifolia. R.* III.

Leaves round, scollop-serrate, downy underneath. *Fruit* peduncled, numerous about the base of the annual shoot, round, hairy. 556

A native of the mountains north of Bengal.

46. F. *polycarpa. R.*

Arboreous. *Leaves* oblong, some of them slightly waved, or serrulate, both sides scabrous. *Fruit* in fascicles, from the trunk, or woody branches.

Introduced from the Moluccas into the Botanic garden at Calcutta, in 1798, they are only small trees at present. In fruit about the close of the rains.

Trunk straight; *branches* sub-erect. *Bark* of the ligneous parts dark brown, and rather scabrous; of the young shoots a little scabrous, with a few short bristles rising single from the centre of a small umbilicated gland. *Leaves* alternate, oblong, somewhat three-nerved; *margins* sometimes entire, sometimes waved, or remotely serrulate, both sides scabrous, from the same sort of bristles and glands as cover the bark of the young parts; a green gland in the axills of the nerves, as in F. *laciniata*; from four to six inches long. *Petioles* coloured, from one to two inches long. *Stipules* as in the genus. *Fruit* in fascicles of as far twenty, from the large branches, or trunk, peduncled, round, the size of a large pea, scabrous with glands and short bristles. *Umbilicus* small, round, and shut with scales. *Calyx* of the fruit none, of the peduncles or bractes, obscure, small and crowded.

47. F. *macrophylla. R.*

Arboreous. *Leaves* round-cordate, three-nerved. *Fruit* collected in bundles near the root, turnip-shaped, from eight to twelve-ribbed, hairy.

I have only found this species in the Company's Botanic garden, where it is in fruit the whole year. It was originally brought from Nepal. It is however, a native of Silhet and Chittagong also. III.

Trunk short, for it soon divides into a few, stout branches, generally by threes, which subdivide irregularly, and spread in every direction. *Bark* brown and considerably scabrous. The tree rarely exceeds twenty feet in height, and spreads as much. *Leaves* alternate, petioled. round-cordate, entire, between obtuse and pointed, three-nerved, above smooth, deep green, marked with some white dots; below very pale, somewhat downy, and reticulate with many transverse small veins; from twelve to eighteen inches long, and nearly as broad. *Petioles* round, from three to six inches long. *Stipules* within the leaves, as in the other species. *Fruit* peduncled, fully as large or larger than the common fig, collected in branches of from six to twenty, on projecting tuberosities on the trunk, and lower parts of the largest branches, they are turnip-shaped, hairy, glandular, and marked with from eight to twelve ridges running from the base to the apex. *Calyx* three-leaved, pressing upon the fruit. *Umbilicus* very large and closed with innumerable heart-shaped, acute scales, some few of which often extend to some distance round its mouth. *Flowers*, only females found, I could not observe any *perianth*; the *stigma* single, hairy, of a beautiful rose-colour. 557

The fruit is eaten by the natives in their curries where the tree is indigenous; every part of it is replete with much, very tenacious, milky juice, which flows abundantly from fresh wounds.

48. F. *lanceolata*, of *Dr. Buchanan.*

Shrubby. *Leaves* lanceolate, smooth, entire. *Fruit* in fascicles near the root, as well as on the trunk and larger branches, peduncled, verrucose, compressed, turbinate, with the umbilicus in the bottom of a deep concavity.

A native of Chittagong, and from thence sent by Dr. Buchanan to this garden in 1798 where it produces fruit, more or less, the whole year round; but chiefly about the beginning of the rains. III.

Trunk scarcely any, but many ascending branches issuing from the crown of the root. *Bark* of the old woody parts ash-coloured, of the young shoots smooth, and green, height of the whole plant in ten years about ten feet, and spreading to a great extent. *Leaves* alternate, short-petioled, lanceolate, entire, smooth on both sides, from four to eight inches long, and from one to one and half broad. *Stipules* as in the genus, smooth and membranaceous. *Fruit* peduncled and collected in small fascicles, from six to eight together, on the stem and larger woody branches near the base, of a short, broad, turbinate figure, much compressed, with a very deep concavity on the crown; in the bottom of which is the umbilicus, shut up with many, fleshy imbricated scales, colour a dark brown, with numerous, verrucose, white specks. *Calyx* generally three small scales at the apex of the peduncle. *Corollets* all female, that were 558

Page Carey Ed. examined.

49. F. *glomerata. Willd.* iv. 1148. *Corom. pl.* ii. *N.* 123.

Leaves broad-lanceolate, smooth. *Fruit* in bundles from the trunk and large branches, peduncled, downy, turbinate.

Oodoombur. Asiat. Res. iv. 309.

Hind. Doombur.

Beng. Jugya-doomoor.

Teling. Bruma-mamadee.

A large tree, generally found in and about villages, and on the banks of rivers, and water courses, where the soil is rich and moist.

Trunk seldom straight, but thick and high. *Branches* thin, and more erect, than in any of the former trees. *Bark* of a rusty greenish colour, and scabrous. *Leaves* alternate, petioled, oblong, or broad-lanceolate, tapering equally towards each end, entire, most slightly three-nerved, smooth on both sides; the under side is paler and covered with most minute green dots, from four to six inches long, and from two to two and a half broad. *Petioles* channelled,
III. from one to two inches long. *Stipules* as in the other species. *Racemes* compound, or panicled,
559 issuing immediately from the trunk or large branches, ramifications spreading and jointed. *Bractes* several surrounding the joints, two-fruited, at least there are always the germs of two, but rarely both come to maturity. *Fruit* pedicelled, nearly as large as common figs, clothed with much soft down, when ripe of a rich orange colour, umbilicus closed with innumerable scales. *Calyx* of the fruit small, three-leaved.

The fruit is eaten by the natives. I have often tasted them, but to me they are disagreeable. This species yields much milky juice.

50. F. *conglomerata. R.*

Arboreous. *Leaves* alternate, sub-semi-cordate, cuspidate, rough and hard. *Fruit* roundish, tubercled, crowded on long, procumbent, or drooping, decompound, cauline, leafless branches.

Borum of the natives of Chittagong, where the tree is indigenous. In the Botanic garden at Calcutta, it is loaded with fruit the whole year.

Trunk tolerably straight. *Bark* of a dirty olive colour. *Branches* numerous, spreading in every direction; *bark* of the young shoots rough and hairy; height of the trees in the Botanic garden, now eleven years old, about twenty feet, and they seem full grown. *Leaves* alternate, short-petioled, by far the greater part of them unequally long-cordate, while the plants are young, serrulate; when old, entire, firm, and very scabrous, particularly on the upper surface; from four to ten inches long, and about half that in breadth. *Stipules* interfoliaceous, and caducous. *Fruit*, from the lower part of the trunk of our trees issue numerous procumbent, diverging, or drooping, ramous, leafless branches, crowded with numerous, sessile, roundish, scaly, warted figs, about the size of a large filbert with a large scaly umbilicus. *Proper perianth* of the female of five, lanceolate leaflets. *Male florets* few, monandrous,
III. with a three-leaved perianth.
560

51. F. *congesta. Roxb.*

Arboreous, smooth. *Leaves* petioled, oblong, entire, smooth. *Fruit* roundish-turbinate, sessile, heaped on radical, and cauline, short, leafless, ramous branchlets, or panicles.

Mussu of the Malays at Amboyna, where it is indigenous, though by no means like that figured in the *95th Table of Rumph. Herb. Amb. vol.* iii. under the same Malay name.

Introduced into the Botanic Garden at Calcutta in 1802, and in 1809. They are now from eight to twelve feet high, with a straight trunk, branches few, clothed with dark brown, now while young trees, smooth bark.

Leaves opposite, and alternate, short-petioled, oblong, entire, smooth, deep green; about six inches long, and about three broad *Fruit* short-peduncled, sometimes a single one or two are found in the superior axills, but by far the most common on large compound racemes or panicles projecting from the trunk, and far the most near the root. They are about the size of a filbert, turbinate, smooth. *Stamina* single. *Stigma* sessile, bright red.

52. F. *racemifera. R.*

Arboreous. *Leaves* alternate, cordate, crenulate. *Fruit* on compound, glomerate racemes, from the woody part of the tree, below the leaves.

Caprificus amboinensis. *Rumph. Amb.* iii. *t.* 93.

A native of Sumatra, from thence introduced into the Botanic garden by Dr. Charles Campbell. The trees are small, and in fruit most part of the year. *Leaves* deciduous during the cold season.

Trunk straight, tapering. *Bark* smooth, dark greenish brown. *Branches* very numerous, and spreading in every direction; *young parts* smooth. *Leaves* alternate, petioled, cordate, crenate, from three to five-nerved, smooth on both sides, from six to twelve inches long.
III. *Petioles* round, smooth, scarcely half the length of the leaves. *Stipules* within the leaves,
561 caducous. *Racemes* often compound, or decompound, projecting at right angles or drooping from the larger naked branches. *Bractes* stipule-like, caducous, long before the fruit appears. *Fruit* solitary, short-peduncled, of a short, flattish, turbinate shape. *Calyx* none.

53. F. *cunia. Buch.*

Arboreous. *Leaves* short-petioled, alternate, bifarious, oblong, semi-cordate at the base, acutely serrate. *Fruit* turbinate, ribbed, pedicelled, and generally in pairs, in compound, prostrate, radical, and cauline, leafless branchlets.

A native of Nepal, from thence Dr. Buchanan sent seeds to the Botanic garden at Calcutta, at the close of 1809; the only tree which was reared, was about twenty feet high; uncommonly well clothed with long spreading branches down to the ground, and constantly

loaded with fruit. Page Carey Ed.

Leaves short-petioled, bifarious, oblong, lanceolate, acute, at the base, the lower half protruding so as to form a large sub-rotund lobe, which is longer than the petiole, margins a little waved, and serrated, scabrous on both sides, from six to twelve inches long, and from two to four broad. *Fruit* pedicelled, somewhat turbinate, a little ribbed, of the size of a large filbert, hairy, they are generally produced in pairs, or in threes, on long, procumbent, radical, and cauline, compound, leafless branches, in compound racemes often some feet long. *Calyx* of the fruit three-cleft, presses in to the calyx.

54. F. *oppositifolia. Willd.* iv. 1151. *Corom. pl.* ii. *N.* 124.

Leaves opposite, oblong, serrate. *Fruit* in axillary pairs or on cauline racemes, round, peduncled, hairy.

Hind. Konea-Doombur.

Sans. Kako-Doomburika.

Beng. Kakodoomoor.

Teling. Boda-Mamadee.

III. 562

A small tree, a native of the banks of rivulets, and other places, where the soil is moist and rich, common about Calcutta.

Trunk erect, seldom as thick as a man's body. *Branches* opposite, sub-erect. *Bark* scabrous, ash-coloured. *Young shoots* scabrous, and covered with much short white hair, piped, and interrupted at the insertion of the leaves, as in the Bamboo. *Leaves* opposite, short, round, petioled, oblong, slightly serrate, of a firm, scabrous texture, shining above, downy below, and most beautifully reticulate, one of each pair is always considerably smaller than the other; they are from five to nine inches long. *Fruit* on the young shoots axillary and peduncled, in the naked woody branches racemed, round, about the size of a large nutmeg, covered with much short, white hair, several equi-distant ridges running from the umbilicus to the base. *Racemes*, and *bractes* as in F. *glomerata*, only here simple. *Calyx* of the fruit three-leaved. *Flowers*, a few round the inside of the mouth of the navel. *Filament* or *peduncles* single, with a proper, three-parted perianth surrounding the middle. *Female flowers* numerous. *Peduncles* long. *Perianth* none. *Style* and *stigma* placed together on the side of the germ, funnel-formed.

This species is productive of much tenaceous milky juice on being wounded. The fruit is not often eaten, nor is the tree used for any purpose that I know of.

55. F. *dæmona. Kön. Mss. Vahl. En. Pl.* ii. 198.

Shrubby. *Leaves* generally opposite, cuneate, oblong, and oblong-pointed, serrate, above scabrous, downy underneath, with a green gland in the axills of the veins. *Fruit* in pairs on long radical racemes, above very hairy, of the size of a nutmeg.

A native of the sandy lands near the sea on the coast of the Tanjore Country. From thence Dr. Rottler sent plants to this garden where they produce fruit, all the year round. In its native barren soil it grows to be a stout ramous shrub, or small tree.

III. 563

Young shoots densely clothed with thick, soft, appressed, white hairs. *Leaves* in general opposite, petioled, oblong, and oblong cuneate, acute, serrate, above smooth, but hard, downy underneath, and elegantly reticulated with numerous, soft, hairy veins, and a deep green, smooth gland in the axills, from two to twelve inches long, one of the pair is always smaller than the other, and when single often oblique as in *Begonia*. *Petioles* round, clothed with appressed pubescence, in each side of their insertion is a green gland. *Stipules* within the leaves, caducous. *Fruit* for the most part in pairs, in radical withering racemes, and frequently of great length, with their apices penetrating the earth. In their native soil the whole raceme, and fruit are often entirely under ground; also found single or in pairs on the trunk and branches, though less frequently than on the root. They are generally about the size of a large nutmeg, obovate, very hairy; the mouth shut with numerous scales, the exterior ones glandular and more remote; several obscure, equi-distant ridges run from the umbilicus toward the base. *Calyx* of the fruit of three-minute scales. *Male corollets* monandrous.

In habit this plant is very much like F. *oppositifolia*, but the inflorescence is very different.

CHARA.

Male calyx none. *Corol* none. *Anthers* solitary under the germ. *Female calyx* four-leaved. *Corol* none. *Stigma* from three to five-cleft. *Nut* spiral, many-seeded.

1. C. *verticillata. Roxb.*

Joints of the stems and branches somewhat prickly. *Leaves* verticelled, ten or twelve-jointed, with flowers on the two or three lower joints. *Calyx* of the other joints abortive.

A native of India, where it grows in standing sweet water; it appears and flowers during both the cold and hot seasons.

III. 564

Stems and *ramifications* numerous, several feet long, floating in the water, jointed, striated, fragile, scabrous, piped, but no stony crust covers them. *Leaves* about twelve in the verticel, tapering, from ten to twelve-jointed, they are about as long as the points of the stem or branches, on the upper side of each joint are four minute bristles, or leaflets of the calyx. *Flowers*, they occupy the upper side of the first two or three joints of the leaves of the verticel. *Male flowers*, what I take for them, are the small, naked, orange-coloured, round bodies close to the base of the germ, which gradually decay as the germ acquires size. *Female flowers* solitary, just above the male, pitcher-shaped, embraced by the four bristle-like leaflets,

Page Carey Ed. already mentioned, and crowned with a fine pointed *stigma;* when this body comes to maturity, it contains one black, spirally grooved seed.

2. C. *furcata. R.*

Stems filiform, smooth. *Leaves* verticelled, proliferous, with flowers crowded in the divisions.

Beng. Jhanj, which is the general name for all such acquatic plants.

Found in tanks, and stagnant sweet water near Calcutta.

Stems and *branches* numerous, jointed, smooth, and of a soft, flaccid texture, often several feet long. *Leaves* or *branchlets* verticelled, about six or seven in the verticel, the superior, or flower-bearing ones proliferous, the most distinct of them resembling compound, and even decompound umbels, with the extreme divisions or joints two or three-pointed, they are smooth in every part; the joints are often so soft, and numerous that the whole seem to be little intricate balls enclosing the blossoms, and seeds with their two-forked extremities projecting hedgehog-like. *Flowers* numerous, in the divisions of the leaves; the *male* ones yellow, and the *female* ones green, mixed, in general the latter are most numerous. *Calyx* of the female no other than the division of the leaves. *Seeds* globular, spiral, with the stigma
III. from three to five-parted on its apex.
565 3. C. *involucrata. R.*

Stems and *branches* filiform, smooth. *Leaves* verticelled, undivided, three or four-jointed, with a male and female flower on each joint.

Beng. Jhanj.

Found in tanks and pools of water near Calcutta during the cold and hot seasons.

Stems and *branches* numerous, and several feet in length, floating in the water, jointed, filiform, smooth and of a soft texture. *Leaves* verticelled, smooth, and generally compound, of three or four joints with the leaves two-pointed. *Bractes* or *involucre*, a whorl of short, pointed bodies, alternate with the leaves, and placed immediately under them. *Flowers* on the joints of the leaves. *Calyx* &c. of both male and female, as in the last described.

MONOECIA DIANDRIA.

LEMNA. Schreb. gen. N. 1430.

Male calyx one-leaved. *Corol* none. *Female calyx* one-leaved. *Corol* none. *Style* one. *Capsule* one-celled, two-seeded.

1. L. *orbiculata. R.*

Leaves sub-sessile, orbicular, flat on both sides, from two or three together. *Roots* fascicled, simple.

Found most part of the year, floating on stagnant water in Bengal.

2. L. *globosa. R.*

Single, globular, rootless, minute, one, or at most two together, singly about the size of a grain of sand.

With L. *orbiculata*, found in very great abundance on tanks and pools of stagnant water
III. in Bengal forming a compact green scum, over the surface.
566 3. L. *cruciata. R.*

Leaves petioled, lanceolate, proliferous, flat on both sides. *Root* solitary or wanting.

Found in Bengal, and generally under the surface of the water in tanks, in most extensive interwoven masses.

MONOECIA TRIANDRIA.

TYPHA. Schreb. gen. N. 1401.

Male ament cylindric, compact. *Perianth* filiform. *Corol* none. *Female ament* cylindric, beneath that of the male. *Perianth* of several fine filaments. *Corol* none. *Seed* one.

1. T. *elephantina. Roxb.*

Leaves ensiform, obtuse, flat on the inside, the length of the stems. *Male ament* from two to three inches above the female. *Filaments* solitary, with from one to three anthers; *neuter corollets* mixed with the fertile female ones.

Beng. Hogla.

Teling. Emiga Junum.

Elephant grass.

It grows in standing sweet water, or slow running rivers and brooks, which do not dry up during the hot season. Flowers during the wet and cold seasons.

Root stoloniferous, perennial. *Culms* straight, round, smooth, glossy, jointed at the insertion of the leaves, and involved, except near the ament, in their sheaths, the naked part near the ament is about the thickness of a common black lead pencil; substance spongy, from six to twelve feet high. *Leaves* long, ensiform, very smooth in every part, below near the sheath a little convex on the outside and concave within, from four to six feet long above the sheaths, and three quarters of an inch broad; *sheath* smooth, embracing the culm, and the sheaths of the inner leaves. *Male ament* from two to three inches above the *female* one and terminating the culm, cylindric, about a foot long and scarcely as thick as the little

finger, every part most closely set with stamens and most fine white filaments. *Spathes* of the male ament, three or more, one, the largest, inserted at its base, a second and smaller a little above the middle, and a third still smaller near the apex, and generally two very small ones at the apex; they all drop off soon after the flowers expand. *Calyx perianth proper.* The filaments that are intermixed with the stamen are so minute that I cannot assign any number to any number of filaments, their extremities are from two to three-cleft. *Corol* none. *Filaments* exceedingly numerous, short, simple, from two to three-cleft, inserted without order. *Anthers* one to each single filament or sub-division, linear, yellow, with green tops, which makes the ament look green, caducous, leaving a naked withered receptacle. *Female ament* about as long and as thick as the male. *Spathe* of the female ament single, leaf-like, its sheath is so long as to involve both aments. *Calyx* permanent, and consisting of most fine capillary filaments. *Pistil* as in the family. *Seed* oblong, they are carried about with the wind like the seeds of the thistle by means of the permanent downy filiform calyx; but there are many clubbed bodies intermixed with the female flowers, these also have a calyx or involucre of the finest filaments like that of the female flowers. Elephants are fond of it; the leaves are used for thatch, by the natives. III. 567

2. T. *angustifolia. Willd.* iv.

Leaves semi-cylindric, acute, the length of the scape. *Male* and *female aments* rather remote.

T. minor. *Curt. Flor. Lond. t.* 169.

Beng. Kam Hogla.

Found in similar places with the former; flowering time also the same, but this is a smaller and much rarer plant.

ZEA. Schreb. gen. N. 1403.

Male in distinct spikes. *Calyx; glume* two-flowered, awnless. *Corol; glume* awnless. *Female calyx; glume* two-valved. *Corol; glume* two-valved. *Style* single, filiform. *Seed* immersed in an oblong receptacle. III. 568

Z. mays. Willd. iv. 200.

Mays, Maize, or Indian corn.

Teling. Moka, Joona.

Beng. Bhoota or Mukka.

Cultivated in various parts of India in gardens, and only as a delicacy; but not any where on the continent of India so far as I can learn, as an extensive crop.

COIX. Schreb. gen. N. 1405.

Male flowers for the most part on a separate spike. *Calyx* two-valved, two-flowered, awnless. *Corol, glume* awnless. *Female flowers* for the most part solitary. *Calyx* or *involucre* one-valved, one-flowered, valve becoming an ossified shining covering for the seed. *Corol* various; *glumes* awnless.

1. C. *lacryma. Willd.* iv. 202.

Leaves at the base cordate; *pedicels* naked, not jointed. *Male spikes* nodding; *flowers* paired. *Calyces* smooth, ovate.

Lithagrostis *lacryma Jobi. Gært. Sem.* i. 7. *t.* 1.

Cafre or Catri Conda. *Rheed. Mal.* xii. *t.* 70.

Lachryma Jobi Indica. *Rumph. Amb.* v. *t.* 75. *f.* 2.

Beng. Gurgur or Kanch.

I have only found this plant in Bengal; what Dr. König and I took for it on the coast, is evidently another species which I now call C. *Barbata.* It is common on the rice grounds and in ditches, and grows to the height of from four to six feet.

Culms annual, ramous, smooth, emitting roots from the lower joints. *Leaves* sheathing, from four to eighteen inches long, and from one to two broad; the broadest part near the base, and there cordate. *Spikes* axillary and terminal, several together, from two to three inches long, sub-erect, peduncled. MALE FLOWERS on the short, nodding, solitary, mealy spikes, from the apices of the female flowers they are in pairs; one sessile, the other peduncled. *Calyx; glume* two-flowered, two-valved; the exterior valvelet oval, with broad margins. *Corol* two-valved. *Nectary* two scales embracing the base of the filaments. FEMALE FLOWERS solitary. *Calyx* or *involucre* one-valved, entire, with a perforation at top for the pedicel of the male spike and stigmas to pass through. *Corol; glume* four-valved; *valvelets* fleshy, on one side of the corol are lodged two somewhat clavate bodies each supporting the rudiments of the corollet. *Germ* ovate. *Pericarp* no other than the calyx or involucre, now white and of a bony hardness. III. 569

2. C. *barbata. Roxb.*

Pedicels short, jointed, with a boat-shaped, cuspidate spathe at the joint. *Male spikes* erect; *flowers* paired; *calyx* hairy. *Female corol* four-valved. *Seeds* oval.

Beng. Gurgur.

Teling. Ghella-Gadee.

Is found in rice fields, and on the banks of water courses, in a moist, rich soil in the Northern Circars.

Roots annual. *Culms* erect and near the top, bowing a little, ramous, jointed, smooth, sulcated, not piped, but replete with a soft spongy substance, from three to six feet high, and

Page Carey Ed. III. 570

as thick as a common quill; joints sometimes bearded. *Leaves* sheathing, from two to three feet long, narrow keeled; *margins* armed with small prickles, on the upper side sometimes a few, sometimes numerous, stiff, white hairs, mouths of the sheaths slightly bearded. *Spikes* numerous, pedicelled, terminal, and from the exterior axills, forming altogether a large linear panicle, collected in fascicles of from two to six on a common peduncle, and embraced by a common spathe. *Pedicels* compressed, jointed near the top and there a partial spathe, their insertions are intermixed with lanceolate, chaffy scales. MALE FLOWERS in pairs, one a little above the other in a secund spike above the female. *Calyx* two-flowered; *valvelets* obliquely oblong, hairy on the outside. *Corol* as in the genus. FEMALE FLOWERS solitary, below the male. *Calyx*, or *involucre*, consisting of one oval, very hard, glossy valve, which embraces most completely the corol, its margins are double, not united, and through this duplicature the pedicel of the male spike passes. *Corol* four-valved, the interior two large and somewhat fleshy.

The rest as described in the *Genera Plantarum*. The grass is of a coarse nature. Cattle do not eat it.

3. C. *gigantea*. *Kön. Mss.*

Pedicels naked; *male spikes* drooping with flowers, three-fold, the middle one pedicelled; *female corol* six-valved, *seeds* ovate.

Beng. Danga gurgur.

Perennial. It grows chiefly in the valleys amongst the Circar mountains and in Bengal.

Culm erect, ramous to the top, round, smooth, jointed, from eight to fifteen feet high, and as thick as a man's thumb at the base. *Leaves* from two to four feet long, and about one inch broad; the upper side and margins backwardly hispid. *Sheaths* short, and smooth. *Spikes* as in the last species. *Spathes*, *common*, of the peduncles, as in the last; *proper*, of the pedicels wanting. *Pedicels* long, filiform, naked, not jointed as in the last species. MALE FLOWERS above the female, as in the last, but here they are more numerous, and three-fold; the two lateral ones sessile, and the middle one pedicelled, they are closely imbricated round the whole of the spike. *Calyx* and *corol* as in the genus. FEMALE FLOWERS single as in the last species. *Involucre* ovate, entire round the circumference, perforated at the apex for the pedicel of the male spike to pass through; like the others it is smooth, glossy, and becomes exceedingly hard within the involucre; on each side of the male pedicel there is a compressed clubbed pedicel, each elevating the rudiment of a corollet; between them and the involucre is the small valvelet of what I call the calyx. *Calyx* common to the above-mentioned clubbed pedicels and the proper female flowers, two-valved; the large one ovate, pointed, embracing entirely the proper flower. *Corol* in general six-valved, four on one side, and two on the other, diminishing in size gradually. *Germ* ovate. *Style* two-cleft, as in the genus.

III. 571

4. C. *aquatica*. *R.*

Floating and creeping from fifty to one hundred feet. *Leaves* linear, most acute, with hispid margins. *Male spikes* drooping, many-flowered; *flowers* three-fold, the middle one pedicelled. *Female corol* from six to seven-valved. *Seeds* turbinate.

A native of the lower parts of Bengal, where it is generally found floating on lakes, and along their margins to a very great extent.

Roots, beside the original ones there are many issuing from the joints of the old stems. *Stems* perennial, jointed, round, smooth, filled with pith, about as thick as a man's forefinger, floating on lakes or creeping along their margins to a great extent; extreme shoots as well as those from the joints arising in an oblique direction to the height of from four to five feet above the surface of the water, and bearing the leaves and flowers. *Leaves*, the lower ones linear-lanceolate, the superior ones ensiform, all have long, tapering, very acute points, with the margins hispid, from one to three feet long, and about the middle, where broadest, from an inch to an inch and a half wide. *Spikes* terminal, and from the exterior axills, peduncled, solitary or in pairs, drooping. FEMALE FLOWERS generally solitary on the base of the male spikes. *Involucre* turbinate, perforated; *calyx* and *corol*, *i. e.* glumes, within the involucre, from six to seven-valved, with two abortive corollets and their common valve, as in C. *gigantea*. *Germ* oblong, round it are three short, abortive stamina. *Style* two-cleft. MALE FLOWERS three-fold, the two lateral ones sessile, the middle one pedicelled, all have a two-valved *calyx* with two-valved flowers in each. *Seed* turbinate, smooth, of a dull pearl colour, the size of a pea.

III. 572

5. C. *heteroclita*. *R.*

Erect, ramous, hairy. *Spikes* terminal, single, or paired, when two one is male, the other androgynous, with a jointed rachis and the five or six female flowers thereof bracted.

A native of the eastern parts of Bengal, where it flowers and ripens its seed toward the close of the rains. It is the smallest of the five species, being only about two, or at most three feet high, but very ramous.

6. C. *pumila*. *R.*

Leaves bifarious, linear-lanceolar, smooth. *Peduncle* terminal, naked, and not jointed. *Male spikes* with from three to four pairs of flowers; *female corol* five-valved, ovate.

Introduced from the Mauritius into the Botanic garden where it grows to be about eighteen inches high, every part smooth, leaves nearly as long as the culms.

CAREX. *Schreb. gen. N.* 1407.

Ament imbricated on all sides, with one-flowered scales. *Corol* none. *Male calyx*, the superior scales of the ament. *Corol* none. *Female calyx*, the inferior scales of the ament. *Corol* flask-shaped, permanent, one-flowered. *Stigma* from two to three. *Seed* solitary, three-

sided, enclosed in the permanent corol.

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1. C. *Bengalensis. R.*

Spikes sessile, androgynous, below female. *Panicles* axillary, and terminal, long-peduncled, ovate, dense; *scales* ovate, acute; *seed* three-cornered, within the ribbed, permanent, flask-shaped corol. III. 573

A native of Silhet, and the only species I have ever met with in India. The culms are long, slender, smooth, and three-sided, leaves very long and slender with a sheathing tubular base.

SCLERIA. Schreb. gen. N. 1408.

Male spikelets imbricated, many-flowered. *Female flowers* solitary, or with one or two male ones in the same two to six-valved calyx. *Corol* three-parted. *Seed* or *nut* globular.

1. S. *biflora. R.*

Culm three-sided, leafly. *Leaves* ensiform, smooth. *Panicles* axillary and terminal, contracted. *Flowers* of both six-pedicelled. *Female calyx* two-flowered, one of them male.

A native of Bengal. Flowers during the rains.

Root of numerous, rust-coloured fibres. *Culms* from one to two feet long, leafy, smooth, three-sided with the angles sharp. *Leaves* very numerous, shorter than the culms, sheathing, sword-shaped, much keeled, smooth. *Panicles* axillary and terminal, small. *Male spikelets* short-pedicelled, oblong, imbricated with oblong concave scales, the lower two or three abortive, and may be called a common calyx; the rest containing three stamens each; beside these there are some others which embrace the base of each pedicel like the *perechetium* of *Hypnum*. *Filaments* permanent, forming a pencil from the spires of the spikelets. *Anthers* linear, incumbent, caducous. FEMALE FLOWERS short-pedicelled, with scales at the base of the pedicels as in the male. *Calyx* three-valved, two-flowered, one of which is a small male corollet with a two-valved corol, and three stamens. *Corol* of the female flower, small, three-parted; *divisions* acute. *Germ* round. *Style* single. *Stigmas* three. *Pericarp; nut* globular, wrinkled, villous. *Seed* solitary, in the cavity of the nut. III. 574

2. S. *lithosperma. Willd.* iv. 316.

Culm three-sided, leafy. *Leaves* with hispid margins. *Panicles* axillary and terminal, patent. *Male* and *female spikes* distinct and sessile. *Female flowers* with the rudiments of one or two male corollets. *Seed* round, ovate, dotted.

Carex *lithosperma. Linn.*

Kaden-pullu. *Rheed. Mal.* xii. *t.* 48.

Teling. Konda-shaka-tonga.

A native of the valleys amongst the mountains of Coromandel.

3. S. *tenuis. Willd.* iv. 316.

Culms slender, acutely three-angled, smooth. *Leaves* long, slender and smooth. *Panicles* slender. *Flowers* in remote fascicles. *Seed* obovate, obsoletely three-sided, polished, white.

A native of the Moluccas, from two to three feet high, long and simple, the axillary panicles excepted.

4. S. *lævis. Willd.* iv. 314.

Culms erect, three-sided, smooth. *Leaves* slender and smooth. *Panicles* oblong, divided by various sized involucres. *Female flowers* sessile. *Seed* oblately spheroidical, even and polished.

A native of the Malay Archipelago.

5. S *corymbosa. R.*

Culms erect, from four to five feet high, three-sided, smooth, leafy. *Leaves* smooth, three-nerved. *Corymbs* axillary, compound. *Seeds* ovate, somewhat acute, shining, white, obscurely three-cornered.

A native of the moist valleys of Chittagong, where it grows to the height of from four to six feet. Stout in proportion, smooth in every part, and replete with very long linear leaves, the uppermost two feet floriferous. III.

6. S. *setigera. R.* 575

Culms erect, from four to five feet high, three-sided, crowded with long, tapering, smooth, three-nerved leaves. *Panicles* terminal, and from the exterior axills, oblong, under each ramification a long filiform bristle-like bracte.

A native of Chittagong.

TRAGIA. Schreb. gen. N. 1410.

Male calyx three-parted. *Corol* none. *Female calyx* six-leaved. *Corol* none. *Capsules* tricoccus.

1. T. *cannabina. Willd.* iv. 326.

Shrubby, twining. *Leaves* hastate, three-lobed, serrate. *Female calyx* pinnatifid.

Croton hastatum. Syst. Veg. But I strongly suspect Burman's figure which he has given for C. *hastatum* is a *mistake.*

Teling. Doolya-gunda.

This species is perennial, from three to four feet high, a native of dry barren ground about Samulkota. It flowers all the year round.

Stem scarcely any, what there is, is erect, and woody. *Branches* numerous; the larger ones woody, smooth; the smaller ones twining and hairy. *Leaves* alternate, petioled, three-

Page Carey Ed. parted, serrate, hairy; from two to four inches long. *Stipules* half lanceolate. *Racemes* leaf-opposed, peduncled, erect, many-flowered. MALE FLOWERS numerous, round the upper part of the raceme, very small, yellow, each three-bracted. *Filaments* half the length of the calyx. *Anthers* two-lobed. FEMALE FLOWERS below the male, generally two on each raceme. *Calyx* six-leaved; *leaflets* pinnatifid, hairy.

The hair of this plant stings fully as bad as the common nettle. Cattle do not eat any
III. part of it.
576 2. T. *involucrata. Willd.* iv. 324.

Shrubby, twining. *Leaves* oblong, three-nerved, serrate. *Female calyx* pinnatifid.

Schorigenam. *Rheed. Mal.* ii. *t.* 39.

Beng. Bichitee.

Ricinocarpus Zeylanica hirsuta. *Burm. Zeyl. t.* 92.

A perennial twining plant, a native of shady places, hedges, &c. where the soil is good. Flowers during most part of the year.

Stem short, woody. *Branches* twining, the tender parts covered with much hair. *Leaves* scattered, petioled, oblong, three-nerved, pointed, serrate, hairy. *Stipules* cordate. *Racemes* as in *cannabina*, but smaller, and seldom more than one female flower on each. *Bractes* and *flowers* both male and female, as in *cannabina*.

Note. The hairs of this plant sting equally as much as the former, nor will cattle eat it.

I have not observed any other in India, to compare with Willdenow's *cordata*, and *hispida*, they are probably the same, or only varieties of one species.

3. T. *Mercurialis. Willd.* iv. 324.

Annual, erect, ramous. *Leaves* ovate cordate, serrate. *Racemes* drooping. Inner three leaflets of the female calyx filiform.

Pee cupameni. *Rheed. Mal.* x. *t.* 82.

A small annual plant, it is much like *Acalypha indica*, appearing in flower during the hot season.

Stem erect, branchy, smooth, about a foot high. *Leaves* alternate, petioled, from cordate to oblong-ovate, serrate, smooth, from one to two and a half inches long, and one to two broad. *Petioles* shorter than the leaves, channelled. *Racemes* axillary, solitary, as long or longer than
III. the leaves, filiform, bowing, few-flowered. *Bractes* remote, solitary, each embracing one, long-
577 pedicelled, female flower, and several short pedicelled male ones. MALE FLOWERS. *Calyx* three-leaved, oval, pointed. *Filaments* shorter than the calyx, *Anthers* two-lobed. FEMALE FLOWERS. *Calyx* six-leaved; the exterior ones oblong, pointed, concave; the three interior ones linear, obtuse. *Germ* three-lobed. *Style* scarcely any. *Stigma* three-cleft, spreading. *Capsule* three-celled, six-leaved, the axills without dots at the base.

4. T. *Chamælea. Willd.* iv. 326.

Erect, slender, smooth. *Leaves* linear.

Chamaelea foliis linearibus. *Burm. Zeyl. t.* 25.

Codi avanacu. *Rheed. Mal.* ii. *t.* 34.

A native of Coromandel, and Malabar, on shaded pasture land.

HERNANDIA. Schreb. gen. N. 1411.

Male calyx none. *Corol* six-petalled. *Female calyx* cup-shaped, entire. *Corol* from six to eight-petalled. *Germ* one-celled, one-seeded; *attachment* superior. *Nut* superior, clothed with the inflated calyx. *Seed* globular. *Embryo* inverse, without perisperm.

H. *Ovigera. Gært. Sem.* i. 193. *t.* 40. *f.* 3.

Arboreous. *Leaves* peltate, cordate, shining, entire. *Panicles* axillary.

Arbor ovigera. *Rumph. Amb.* iii. *t.* 123. In this figure the fruit is something like, but the leaves and general habit very unlike. The same author's Arbor Regis, H. *Sonora, vol.* ii. *p.* 257. *t.* 85. is good for the leaves of that species, but nothing like the fruit.

A native of the Moluccas, and from thence introduced into the Botanic garden in 1798. In twelve years the trees were from twenty to thirty feet high, with a straight, smooth trunk,
III. and incurved branches. The young shoots of a deep lucid green.
578 *Leaves* alternate, petioled, peltate, cordate, entire, smooth, of a shining, deep green on both sides, from five to six inches long, by four or five broad. *Petioles* nearly as long as the leaves, round, smooth. *Stipules* none. *Panicles* axillary, corymbiform, longer than the petioles, all the divisions smooth, lucid green. *Flowers* numerous, small, white. *Bractes*, exclusive of the involucres, oblong, one at each division of the panicle. *Involucre* four-leaved, three-flowered, viz. two male and one female, oblong, expanding. MALE. *Perianth* none. *Corol* six-petalled; the exterior one rather longer than the inner one. *Nectary*, six elevated glands, alternate with the stamens. *Filaments* three, incurved, sub-clavate, shorter than the petals. *Anthers* a large groove on each side of the apex of the thickened filament. FEMALE shorter pedicelled than the male. *Perianth* beneath cup-shaped, with an entire mouth. *Corol* superior, petals eight, the inner four smaller, all inserted on the apex of the germ. *Nectary* four yellow glands, alternate with the four inner petals. *Germ* the perianth, but under the corol, oval, one-celled, containing one ovulum, attached to the top of the cell. *Style* shorter than the petals. *Stigma* large, with a spreading lobed margin.

For the fruit see Gærtner's work above quoted, where the description and figures are both very accurate.

MONOECIA TETRANDRIA.

Page Carey Ed.

SERPICULA. Schreb. gen. N. 1413.

Male calyx four-toothed. *Corol* four-petalled. *Female calyx* four-parted. *Pericarp* a downy nut.

S. *verticillata. Willd.* iv. 329. *Corom. pl.* ii. *N.* 164.

Dioecous, ramous. *Flowers* triandrous. *Leaves* verticelled.

Hottonia serrata. *Willd.* i. 314.

Teling. Poo-natsoo.

III. 579

It grows in clear, standing, sweet water, and produces its flowers during the cold season. It consists of simple, filiform roots, and a number of fine, filiform, jointed shoots, or stems, some creeping, some floating below the surface of the water.

Branches solitary, axillary. *Leaves* sessile, verticelled, (from three to six-fold) oblong-lanceolate, or linear-lanceolate; from one-eighth to half an inch long. MALE FLOWERS axillary, sessile, from one to four in the verticel, much smaller than the female. *Calyx; spathe* one-flowered, sub-globular, murexed, bursting irregularly. *Perianth* three-leaved. *Leaflets* obovate, reflexed. *Corol* three-petalled; *petals* wedge-formed, reflexed. *Filaments* three, short, ascending. *Anthers* very large, two-lobed, opening with an elastic jerk; pollen white, very large grained. FEMALE FLOWERS in a distinct plant, axillary, generally solitary, though sometimes there are two from the same verticel. *Spathe, perianth,* and *corol* as in the genus. No nectary. *Germ* sessile, subulate, ending in the long, sub-erect receptacle of the flower, which elevates it above the water while expanded. *Stigmas* three, lanceolate. The *capsule* has the appearance of a siliqua, subulate, sometimes murexed, one-celled. *Seeds* from three to five, oblong, pointed at each end, lodged as in the leguminous plants, their attachments I could not discover.

Note. When the male flowers are ready to expand, the murexed spathe bursts, the flowers are then quickly detached, and swim remote from the parent plant, on the surface of the water, in search of the female flowers; resting on the extremities of the reflexed leaflets of the perianth and petals of the corol. What a wonderful economy!

The Berhampore sugar refiners use this part while moist, to cover the surface of their sugars, as clay is used in the West India Islands, and in two or three days, the operation is finished exceedingly well.

ALNUS. Schreb. gen. N. 1419.

III. 580

Male calyx the scales of the ament, three-flowered. *Corol* from three to four-parted. *Female calyx* the scales of the ament, two-flowered. *Corol* none. *Styles* two. *Nut* compressed, two-celled.

1. A. *glutinosa. Willd.* iv. 334.

Male peduncles branched. *Leaves* roundish-obovate, serrulate, some obtuse, some pointed; *veins* glutinous, and their axills villous underneath. *Stipules* lanceolate oblong.

Found by Colonel Hardwicke, on his tour to Shreenagur.

See *Asiat. Res.* vi. *p.* 373.

2. A. *dioeca. R.*

Leaves oblong, polished, entire, obtuse pointed, axills of the veins naked. *Male aments* sessile, cylindric. *Stipules* falcate, lanceolate.

Kokra the vernacular name at Silhet, where the tree is indigenous, and grows to be of considerable size; its timber very hard, and used for various economical purposes. The tree flowers in March, and the seed ripens about the beginning of the cool season.

Young branchlets smooth, much divided. *Leaves* alternate, short-petioled, oblong, entire, obtuse pointed, of a firm texture, and very smooth; from three to six inches long, and from two to two and a half broad. *Stipules* falcate-lanceolate, ciliate. MALE AMENTS axillary, several together, sessile, cylindric, about an inch long. *Scales* reniform, ciliate, concave, from three to four-flowered. *Calyx* four-parted. *Corol* none. *Filaments* four, arising from the base of the segments of the calyx, and of their length. *Anthers* two-lobed. *Germ* a small sub-cylindric, villous gland in its place. FEMALE AMENTS on a separate tree; axillary and lateral below the leaves, solitary, sessile, sub-globular, few-flowered. *Scales* of the ament, and calyx as in the male. *Corol* none. *Stamina* none. *Germ* superior, oblong, hairy, two-celled, with two ovula in each, attached to the top of the partition. *Style* scarcely any. *Stigma* of four, brown, glandular, recurved lobes. *Capsule* nearly round, the size of a black currant, pretty smooth, olive-coloured, two-celled, four-valved. *Valves* composed of two coats, the exterior one friable, the inner one thin and tough like parchment, its incurved edges forming the partition. *Seeds* generally single, though sometimes two, integuments three, the exterior one succulent and orange-coloured, the second thin, firm, and white like parchment, and the inner one membranaceous. *Perisperm* conform to the seed, white. *Embryo* green, inverse. *Cotyledons* obovate. *Radicle* superior.

III. 581

URTICA. Schreb. gen. N. 1422.

Male calyx four-leaved. *Corol* none. *Female calyx* one-leaved, or two-valved. *Corol* none. *Seed* solitary.

1. U. *scabrella. R.*

Page Carey Ed. Shrubby, spreading. *Leaves* opposite, cordate, serrate, harsh, three-nerved. *Spikes* axillary, erect, cylindric; the *male* ones crowded, short, and in the lower axills; the *female* ones above and generally solitary.

A native of Chittagong, where it is common, but so far as I know, applied to no useful purpose; nor does it sting, though harsh to the feel. It flowers about the end of the rains, and the seed ripens in the cool season.

2. U. *parviflora. Roxb.*

Dioecous, herbaceous, erect, armed with numerous strong, harsh, pellucid, stinging bristles. *Leaves* opposite, ovate, lanceolate, serrate. *Stipules* undivided. *Female spikes* quatern, compound, glomerate.

III. 582 A native of Rohilcund. In the Botanic garden where it was introduced in 1803, it blossoms in March, and April, but has not ripened its seed, owing, I presume, to our plant, so far as I have been able to observe, bearing only female flowers.

Root ramous, perennial. *Stems* herbaceous, erect, about three feet high, and with but few branches, four grooved on the sides, with but few angles rounded, and every part armed with numerous, strong, very sharp, clear, stinging bristles. *Leaves* opposite, petioled, ovate, and ovate lanceolate, grossly serrate, wrinkled, about three inches long, by one broad. *Petioles* scarcely half the length of the leaves, armed. *Stipules* opposite, entire, oblong, conic. FEMALE FLOWERS. *Panicles* quatern, that is, two in each axill, as in U. *dioeca*, which it most resembles. *Flowers* very minute, green. *Calyx* of two opposite pairs of oval leaflets. *Stamina* none. *Germ* oval. *Style* none. *Stigma* a pencil of white hairs.

3. U. *trinervia. R.*

Shrubby. *Leaves* opposite, broad-lanceolate, crenate, distinctly three-nerved to the apex, panicles axillary, the length of the petioles.

A native of Chittagong, where it blossoms in April.

4. U. *alienata. Syst. Veg.* 709.

Annual, erect while young; *branches* brachiate. *Leaves* opposite, petioled, ovate, three-nerved, entire. *Flowers* axillary, sessile, female calyx urceolate.

Boehmeria alienata. *Willd.* iv. 341.

Parieteria Zeylanica. *Linn. Sp.* 1492.

Parieteria Cochin-chinensis. *Lour. Cochin Ch.* 456.

A native of Ceylon, and introduced by General Macdowall into the Botanic garden where it blossoms during the rains.

Root ramous, annual. *Stem* erect, nearly round, somewhat scabrous. *Branches* from two to three pairs, decussate, height of the whole plant from six to twelve inches. *Leaves* opposite, petioled, ovate, three-nerved, entire, somewhat scabrous underneath, length from one to two inches. *Stipules* two on each side, acute and slender. *Flowers* axillary, sessile, several female with one or two male ones, both sorts are very small. *Male calyx* to the base four-cleft. *Female* urceolate, from eight to ten-ribbed. *Seed* ovate, acute. *Calyx* smooth, shining, of a chesnut colour, with a white base.

III. 583

5. U. *tuberosa. R.*

Root tuberous. *Leaves* alternate, oblong, three-nerved, hairy. *Flowers* axillary, sessile; *seed* much pointed.

Herba memoria. *Rumph. Amb.* vi. *t.* 12. *f.* 2.

Is exceedingly like old plants of U. *alienata*; and young plants of this are very like *Parieteria officinalis.*

Teling. Pilli-dumpa.

A native of the banks of water courses, hedges, &c. where it meets with a good soil, and shady situation. It flowers during the wet and cold seasons.

Root perennial, tuberous, spindle-formed, perpendicular. *Stems* or *branches* several, annual, from one to six feet long, flaccid, resting on the ground, or bushes; striated, a little hairy. *Leaves* spreading, petioled; on the lower part of the primitive stem opposite, larger, and much broader in proportion, than on the branches, where they are alternate, pointed, entire, three-nerved and hairy, from one to three inches long, and broad in proportion. *Flowers* axillary, sessile, crowded. *Male* and *female* mixed, very small. MALE. *Nectary* a pedicelled gland in the centre; the rest as in the genus. FEMALE. *Calyx* one-leaved, gibbous, mouth contracted, and slightly notched. *Style* long, hairy. *Stigma* acute. *Seed* ovate, acute.

The roots are esculent, and nutritious; the natives eat them raw, boiled, or roasted.

6. U. *pentandra. Roxb.*

Perennial, diffuse. *Leaves* opposite, and alternate, sub-sessile, linear, small, three-nerved. *Flowers* axillary, pentandrous; the *male* ones peduncled; the *female* ones sessile, with calyx winged.

III. 584

Hind. Pippira-Saree.

Is found about Calcutta, growing among bushes in wet places; flowers during the rains.

Root of capillary fibres. *Stem* long and slender, resting on the earth, and rooting; above erect, seemingly perennial, round, smooth, the inferior branches opposite, and cross-armed, the superior ones flower-bearing, alternate. *Leaves* the inferior ones opposite, somewhat petioled, and larger, the upper ones smaller, alternate, and sessile, all linear-lanceolate, three-nerved, somewhat scabrous, serrate; size very various; about four inches long. *Flowers* axillary, two female ones generally placed on the outsides and sessile, while several peduncled male ones occupy the centre, and expand in succession. The MALE FLOWERS before they expand appear like a most regular, five-sided, half-excavated cup, with a beautiful, fringed, scolloped margin. *Calyx* five-leaved. *Corol* none. *Nectary* none. *Stamens* five, flying open with a re-

markably smart jerk. FEMALE FLOWERS. *Calyx*, I cannot separate it from the germ. *Germ* obcordate, compressed, two-winged, with an elevated ridged appendix on the inside. *Style* villous. *Seed* ovate, lanceolate, acute, smooth, base white, upper part brownish black. Page Carey Ed.

7. U. *suffruticosa. R.*

Suffruticose. *Leaves* alternate, lanceolate, broadest at the base, entire, three-nerved, smooth. *Flowers* axillary, crowded, sub-sessile. *Female calyx* one-leaved, ribbed, mouth bidentate.

From Sumatra, this perennial, somewhat shrubby plant, was introduced into the Botanic garden at Calcutta in 1803, where it is in constant flower and seed the whole year.

Root fibrous. *Stem* short, somewhat ligneous, soon dividing into many diffuse, and erect, round branches and branchlets, covered with coloured bark, over which are many short, appressed, white hairs, the whole extent of the longest of our young plants about two feet. III. *Leaves* scattered, short-petioled, drooping, from ovate-lanceolate below, to linear-lanceolate 585 above, three-nerved, the upper surface smooth, and somewhat lucid; plain underneath, and somewhat hairy, particularly the nerves; general length about two inches, and half an inch broad. *Stipules* paired, conic, acute, embracing the little bundles of flowers. *Flowers*, male and female crowded in the same axill, sub-sessile, small, of a greenish yellow. *Female calyx* one-leaved, with a contracted, bidentate mouth; and the outside deeply ribbed and hairy. *Seed* ovate, acute, polished, of a dark brownish black.

8. U. *minima. R.*

Annual, diffuse. *Leaves* alternate, ovate, deeply crenate. *Flowers* in terminal, compound, peduncled fascicles; *female flowers* numerous, with a two-leaved calyx.

A native of the Island of Honimoa, and far the smallest of the genus I have yet met with, its greatest extent being only over a space of from four to five inches.

9. U. *interrupta. Linn.*

Annual, erect, bristly. *Leaves* cordate, serrate. *Racemes* compound; *partial racemes* corymbed. *Stipules* solitary, two-cleft. *Seeds* compressed, obliquely cordate.

Batti scorigenam. *Rheed. Mal.* ii. *t.* 40.

Beng. and *Hind.* Lall bichiti.

Boehmeria interrupta. Willd. iv. 342.

A large annual found wild near Calcutta; flowering time the rainy season.

Root ramous, annual. *Stem* erect, flexuous, furrowed, bristly, from two to four feet high; *branches* axillary, like the stem. *Leaves* alternate, petioled, deeply serrate, three-nerved, besprinkled with a few small bristles, particularly the coloured nerves and larger veins; from two to six inches long, and nearly as broad. *Petioles* as long as the leaves, coloured, round, bristly. *Stipules* axillary, solitary, half two-cleft; *divisions* subulate, fringed. *Racemes* axillary, soli- III. tary, erect, from six to twelve inches long, composed of remote, twice two-cleft, recurved 586 corymbs. MALE FLOWERS few. *Calyx*, &c. as in the genus. FEMALE FLOWERS numerous. *Calyx* one-leaved, of an oblique, cup-form, compressed, mouth four-toothed. *Pistillum* half immersed in the calyx, obliquely ovate. *Seed* compressed, cordate, sitting on the mouth of the now totally reflexed calyx, and covered with a yellowish, fleshy, rugose integument, which adheres to, and drops with it.

The hairs of this plant sting like the common nettle.

10. U. *heterophylla. Willd.* iv. 362.

Annual. *Leaves* alternate, cordate, variously lobate, grossly serrate. *Male* and *female flowers* on distinct, glomerate, peduncled spikes; every part armed with stiff, acute, burning bristles.

Ana schorigenam. *Rheed. Mal.* ii. *p.* 77. *t.* 41.

A native of the mountains of Malabar, from thence the seeds were sent by Dr. Buchanan, to the Botanic garden at Calcutta, where the plants blossom and ripen their seed during the cold season; soon after which they perish.

Root annual, ramous. *Stem* erect, flexuose, angular, with small white specks, in which are inserted stiff most acute bristles, pointing rigidly in every direction; *branches* ascending, and like the stem. *Leaves* alternate, long-petioled, cordate, lobate, towards the top of the plant almost palmate, all are grossly serrate, armed with the same bristles as the stem and branches, and some harsh pubescence beside; from four to eight inches long, breadth nearly the same. *Petioles* about half the length of the leaves, channelled and armed. *Stipules* large, axillary, solitary, cordate, with the apex ending in one or two acute points. *Peduncles* axillary, the lower supporting the male, sub-cylindric, amentaceous flowers; those towards the apex of the plant, the female ones, in large, glomerate, variously divided spikes. *Male flowers* as in the genus. *Female* with a cymbiform, tridentate calyx. III.

This is the most ferocious looking plant I have seen, and it acts up to its appearance; 587 the least touch of any part produces most acute pain, but fortunately of short duration. The bark abounds in fine, white, glossy, silk-like, strong fibres.

11. U. *vesicaria. Roxb.*

Shrubby, erect. *Leaves* alternate, broad-lanceolate, three-nerved, entire, downy. *Flowers* axillary, crowded, sessile. *Female calyx* with an inflated swelling round the base.

A shrubby species, a native of the Circar mountains. Flowering and seed time the wet season.

Stems or *branches* several, perennial, somewhat shrubby, from four to six feet high, erect, round, somewhat winding. *Bark* of the woody parts smooth, ash-coloured, that of the young shoots hairy. *Leaves* alternate, spreading, petioled, broad-lanceolate, entire, downy, three-nerved; from two to three inches long, and about one broad. *Stipules* semi-lanceolate, cadu-

Page Carey Ed. cous. *Flowers* axillary, sessile, crowded; *male* and *female* mixed. *Male calyx* four-parted. *Nectarial glands* ovate, small. *Female calyx* as in U. *tuberosa*, round its base on the outside are, from five to six or seven small, obovate, inflated, permanent vescicles. *Style, stigma* and *seed*, as in *tuberosa*.

12. U. *decumana*. *Rumph. Amb.* vi. *t.* 20. *f.* 1.

Shrubby. *Leaves* alternate, cordate, serrate, rugose, bristly. *Female spikes* composed of alternate, bifarious ramifications.

Mal. Daun Gattal.

Introduced from the Moluccas, into the garden at Calcutta in 1802. In April 1803 one plant blossomed. It had only a short ligneous stem, covered with smooth, ash-coloured bark, and some few short, young, round, bristly branches arising therefrom.

III. 588 *Leaves* alternate, petioled, cordate, serrate, very rugose, both sides armed with clear, sharp, stinging bristlets, about six inches long, by three broad. *Petioles* rather short, somewhat channelled, bristly. *Stipules* solitary, interfoliaceous. *Female spikes* axillary, solitary, compound, expanding, larger than the leaves, their branches alternate, bifarious, and composed of minute alternate branchlets, all round, deeply coloured, and bristly. *Female flowers* numerous, sessile, intermixed among small coloured, bristly bractes. *Calyx* four-leaved. *Corol* none. *Stamina* none. *Germ* ovate. *Style* and *stigma* single, and villous. *Seed* solitary, compressed.

13. U. *pulcherrima*. *R.*

Dioecous, shrubby. *Leaves* alternate, lanceolate, serrate, three-nerved, veins reticulate; underneath hoary and pitted. *Spikes* axillary, paired, compound, glomerate, recurved, *male flowers* pentandrous.

A most beautiful shrub, a native of Chittagong; flowering during the rains; the seed ripens in the cool season.

Stem as thick as a man's leg, very short, but straight. *Branches* numerous, spreading in every direction round the stem. *Bark* of the old woody parts brown, and pretty smooth; that of the young, coloured shoots angular, and clothed with short appressed hairs. *Leaves* alternate, rather long-petioled, exactly narrow-lanceolar, beautifully serrate, long, tapering, acute-pointed, three-nerved, with elevations on the upper surface corresponding with the pits below, which render them rough though lucid, about six inches long, by one broad. *Veins* diverging and reticulate, hoary underneath, and there parted round the margin, and slightly in the middle of the space between the nerves. *Petioles* from one to two inches long, a little hairy, coloured and channelled. *Stipules* axillary, small, scariose. *Male calyx* in axillary pairs, recurved in opposite directions, compound, glomerate. *Calyx* five-leaved. *Stamina* five. *Female spikes* on a different plant and like the male. *Calyx* of one, two-lobed, bivalvular-like, III 589 ciliate leaflet. *Germ* oval. *Style* none. *Stamina* a villous tuft.

14. U. *frutescens*. *Thunb. Juss.* 70.

Shrubby. *Leaves* alternate, short-petioled, lanceolate, cuspidate, three-nerved, with the interior margins serrulate, hoary underneath, harsh above. *Heads* axillary, peduncled.

Boehmeria *fructescens*. *Willd.* iv. 343.

A native of the mountains north of Bengal, and Oude, as well as of Japan.

15. U. *bicolor*. *R.*

Shrubby. *Leaves* alternate, short-petioled, lanceolate, serrate, three-nerved, scabrous above, hoary underneath. *Heads* axillary, sessile.

A native of the mountains of Bareilly.

16. U. *Sphaerocephala*. *R.*

Shrubby. *Leaves* alternate, petioled, oblong, toward the apex serrulate, strongly marked with three equal nerves, scabrous above, hoary, except the veins and nerves, underneath. *Heads* axillary, peduncled, spherical, crowded with male and female flowers mixed.

17. U. *paniculata*. *R.*

Shrubby. *Leaves* alternate, cordate, serrate, acute, three-nerved, reticulated, rough above, and soft with white down underneath. *Stipules* in opposite pairs, ensiform. *Panicles* axillary, short and crowded.

A native of the Moluccas; with the foliage of U. *decumana*, but a very different inflorescence. The calyx of the female flowers in that is three or four-leaved; in this a five-toothed cup.

18. U. *lineata*. *R.*

Leaves alternate, petioled, oblong, entire, smooth, marked with parallel simple veins. *Stipules* solitary, spathiform. *Panicles* axillary, the length of the petioles, dichotomous. III. *Female calyx* unequally four-parted.

590 A native of the Moluccas, where it grows to be a large straggling shrub, with leaves from six to twelve or more inches long. Panicles composed of numerous alternate incurved divisions, crowded with innumerable, sessile, female flowers on their opposite margins only.

19. U. *tenacissima*. *R.*

Shrubby, erect, ramous. *Leaves* alternate, long-petioled, broad-cordate, grossly serrate, hoary underneath. *Panicles* axillary. *Flowers* in round fascicles; the male ones on the lower panicles and the female ones above.

Caloose. *Marsden's Sumatra. p.* 57.

Rami, the Malay name in the Island of Pulo Pinang.

A native of the Island of Sumatra, where it is cultivated for its bark, which abounds in fibres of very great strength and fineness. In the Botanic garden where it has lately been introduced, with the view of obtaining its valuable fibres, it grows very luxuriantly, and blos-

soms about the close of the rainy season. We have now had it five years in the garden, the roots of the original plants, as well as of their progeny, are becoming daily extended, and continue healthy and vigorous, throwing up numerous shoots, as often as they are cut down for the fibres of their bark, which may be done about four or even five times every year, if the soil is good and care taken of the plants, viz. if kept clean of weeds, and watered when the weather is so dry as for the soil to require irrigation, and carefully drained when too wet. Page Carey Ed.

The plant is as readily cultivated from cuttings, as the Willow, which is fortunate, as I have never yet found it produce fertile seed.

Stems, when suffered to remain, they become stout, and ligneous, and then covered with brown, somewhat scabrous bark. *Branches* many, spreading considerably, the ligneous parts with bark like the stems; the tender parts hairy. *Leaves* alternate, long-petioled, cordate, hairy, and a little hoary underneath, three-nerved; about six inches long, by four broad. III. *Stipules* ensiform, one on each side of the insertion of the petiole. *Panicles* in axillary pairs, 591 about as long as the petioles, villous. *Flowers* numerous, small, of a greenish yellow, collected in small, globular heads; male on the inferior panicles, and female on the superior ones. *Bractes* minute. MALE. *Calyx* of four ovate, concave leaflets. *Corol* none. *Nectary* a globular pedicelled gland in the centre resembling a pistillum. *Filaments* four. *Anthers* two-lobed. FEMALE. *Calyx* one-leaved, urceolate. *Corol* none. *Stamina* none. *Germ* oblong, minute, hairy, no filaments surrounding it, as in Louriero's U. *nivea*. *Stigma* single, hairy, and about the length of the germ. *Seeds*, they have not been found in a ripe state.

To procure the fibres, Marsden says the shoots are cut down, dried, and beaten, after which the rind is stripped off. Rumphius's *Ramium majus, Hor. Amb.* 215. *t.* 79. *f.* 1, which I take to be this plant; yields also fibres of the same nature, and is quoted by Willdenow for *Urtica*, which from the prevailing definition of that plant, "*Foliis sub-orbiculatis utrinque acutis, vel base attenuatis,*" I must conclude to be a different species, for in all the plants in the Botanic garden, originally from Sumatra, from Prince of Wales' Island, and from Rungpoor, they are uniformly broad-cordate. Both male and female inflorescence glomerate, panicled. *Calyx* of the latter of one leaf, and the germ destitute of the barren filaments which Louriero gives to U. *nivea*.

20. U. *crenulata*. *R.*

Shrubby, dioecous, erect. *Leaves* alternate, oblong, acute, crenate. *Spikes* axillary, compound, dichotomous.

A native of the eastern parts of Bengal, and first found near Luckipore by Dr. Buchanan; flowering time the latter part of the rains.

Stem erect, shrubby. *Bark* smooth, ash-coloured, armed with most acute, burning hairs. III. *Leaves* alternate, short-petioled, oblong, acute, crenulate, or slightly dentate, both sides armed 592 with a few burning white hairs. *Stipules* cordate, small, caducous. FEMALE.* *Spikes* axillary, solitary, dichotomous, with alternate lateral divisions. *Flowers* numerous, all female. *Calyx* four-parted. *Germ* ovate, one-seeded. *Style* none. *Stigma* long, villous, fleshy and tapering.

21. U. *acuminata*. *R.*

Sub-arboreous, hairy. *Leaves* petioled, broad-lanceolar, entire, acuminate. *Female glomerules* axillary, small, globular; in short, once or twice-dichotomous peduncles.

A small, erect, ramous tree, with dusky bark and hairy branchlets, a native of the forests of Chittagong, where it flowers during the cool season.

22. U. *involucrata*. *R.*

Arboreous. *Leaves* alternate, broad-cordate, downy, sub-entire. *Stipules* opposite, subulate. *Peduncles* axillary, drooping, bearing a few female flowers in an involucred head.

A native of the Malay Islands. In the Botanic garden it is in blossom the whole year, but no male flowers have been found, nor do the seeds ripen.

23. U. *naucliflora*. *R.*

Dioecous, shrubby, twining. *Leaves* alternate, cordate, entire; *glomerules* globular, compact, the male ones panicled.

A large, scandent, woody plant, common in the forests of Chittagong, Silhet, and the eastern frontier of Bengal. In the former known by the vernacular name *Dolea Sat*, and in the latter *Luta Kudum*, *i. e.* scandent *Nauclea*. *Flowers* beautiful and fragrant, appearing at various times through the year, but ripening best about or before the beginning of the rains. III.

Stem and *large branches* stout and woody, covered with dark coloured, scabrous bark, 593 the whole extending to a great length by twining up and over trees, &c. *Leaves* alternate, petioled, cordate, entire, smooth; from four to eight inches long, by from three to six broad. *Petioles* half the length of the leaves, round, coloured. *Stipules* axillary, solitary, large, ovate-oblong, smooth, of a deep dark ferruginous colour. MALE. *Panicles* from the old axills composed of numerous, small, globular heads of minute, very fragrant corollets. *Bractes* in fours, at the divisions of the panicle, oval, and oblong, coloured like the stipules. *Common perianth* none, or very obscure; *proper* one four-leaved; *leaflets*, oblong, concave, sub-cucullate over the anthers. *Corol* none. *Filaments* four, very broad and short. *Anthers* cordate. *Germ* none, but a columnar, headed gland in its place. FEMALE on a different plant. *Peduncles* from the axills of the former leaves, as in the male, generally solitary, once or twice dichotomous, with a large globular head of small, beautiful, purple, fragrant, pedicelled corollets on each division. *Bractes* as in the male. *Proper perianth* one-leaved, four-parted, segments often unequal. *Corol* none. *Stamina* none. *Germ* superior, oblong, one-celled, containing one ovulum

* I have not yet met with the male.

Page Carey Ed. attached to the bottom of the cell. *Style* short. *Stigma* lateral, oblong. *Pericarp* none, the remaining succulent calyx covering a single, oblong seed, which has, besides an exterior succulent envelope, a middle thin hard one, and an inner membranaceous one. *Perisperm* while the seeds are recent there is a thin succulent one. *Embryo* inverse. *Cotyledons* two, oblong. *Radicle* cylindric, superior.

24. U. *globulifer. Roxb.*

Dioecous, shrubby, scandent. *Leaves* alternate, long petioled, oblong, entire, villous. *Panicles* axillary; *glomerules* globular, compact, panicled.

III. 594 Lal-Kadum, the vernacular name in Silhet, where the plants are found indigenous, climbing over trees and bushes. Flowering time February and March. The seeds are ripe about the beginning of the rains in June. This species much resembles U. *naucliflora*, but the leaves differ widely in shape; the female glomerules as well as the male ones are in crowded panicles, and all being void of fragrance, point them out very distinct species.

25. U. *inæqualifolia. R.*

Shrubby, erect, hispid. *Leaves* alternate, sessile, unequally falcate, lanceolate, entire, acuminate. *Glomerules* axillary.

A native of Chittagong, where it flowers in April.

MORUS. Schreb. gen. N. 1424.

Male perianth four-leaved. *Corol* none. *Female perianth* four-leaved. *Corol* none. *Germ* one-celled, one-seeded, superior. *Styles* two. *Calyx* becoming a berry. *Seed* one, in each acine. *Embryo* inverse and furnished with a perisperm.

1. M. *alba. Willd.* iv. 368.

Leaves cordate-serrate, without pubescence, some deeply and variously lobate, other almost palmate. *Fruit* ovate, oblong, white.

Found in gardens in several parts of India and varying so much by culture as to render it difficult to give a better definition than the above. It does not appear to be cultivated in every part of India for its leaves to feed silk-worms. The fruit rather small, juicy, but insipid.

In Bengal it blossoms about the end of the cold season, and the fruit ripens in about six weeks, or two months afterwards. It appears to be dioecous, for I have only met with female III. flowers on the plants cultivated in the Botanic garden at Calcutta.

595 2. M. *atropurpurea. R.*

Leaves cordate, very rarely lobate, serrate, smooth. *Ament* cylindric. *Fruit* cylindric, dark purple.

M. *rubra. Lourier. Cochin Ch.* 679.

From China this large species was introduced into the Botanic garden at Calcutta, where it thrives luxuriantly, blossoms about the beginning of the hot season, in February, and the fruit ripens in March and April.

Attempts have been made to feed the silk-worm in Bengal with its leaves; but, so far as I can learn, with little or no success.

Trunk rarely more than a few feet in height, and in our young trees in Bengal from eighteen to twenty-four inches in circumference. *Bark* ash-coloured, and rather scabrous. *Branches* and *branchlets* nearly erect, long, simple, and pretty stout, bark of the old ligneous parts like that of the trunk; that on the younger branches more smooth, and lighter coloured; the general height of our largest trees about twenty feet. *Leaves* alternate, cordate, serrate, acuminate, smooth, three-nerved, with a gland on the base of the lateral nerves, about six inches long, by five broad, caducous during the cool season; and the new foliage begins to appear with the flowers in February. *Petioles* nearly round, smooth, an inch and a half long. *Stipules* ensiform, chaffy, caducous. *Aments* axillary, and below the first leaves of the tender shoots, peduncled, generally drooping. The male flowers on one tree and the female ones on another, though sometimes they are monoecous, or polygamous. MALE. *Aments* cylindric, drooping. *Corollets* pedicelled. *Calyx* four-leaved, or deeply four-parted. *Corol* none. *Filaments* four, more than twice the length of the calyx. *Anthers* oval. *Germ* none, but a small conic gland in its place. FEMALE. *Aments* cylindric, drooping. *Corollets* sessile. *Calyx* four-leaved. *Leaflets* obovate, appressed to the germ. *Corol* none. *Stamina* none. *Germ* oval, one-III. celled, containing one ovulum attached to the top of the cell. *Styles* two, revolute, villous, 596 rather united at the base. *Stigmas* simple, small. *Fruit* cylindrical, composed of numerous, ovate, acute, one-celled, nuciform capsules, enveloped in the enlarged, now succulent, dark purple calyx. *Seed* solitary, with scanty albumen, and embryo exactly as in M. *alba. Gært. Sem.* ii. 199. *t.* 126.

3. M. *serrata. R.*

Arboreous. *Leaves* evenly cordate, three-nerved, grossly and acutely serrate, cuspidate, rough, but void of pubescence. *Female aments* cylindric.

Heemoo of the natives about Dosa.

Found by Captain Hardwicke wild in the forests about Dosa, in his tour to Shreenagur. See *Asiat. Res.* vi. 373. *Morus. N.* 1.

It differs from all the species I have yet seen in the apices of the leaves being very long and sharp, and in most of the serratures being remarkably large and acute.

4. M. *Indica. Willd.* iv. 370.

Dioecous, sub-arboreous. *Leaves* ovate, cordate, long, taper-pointed, serrate, smooth. *Aments* oval. *Styles* single, half two-cleft.

Morus Indica, *Rumph. Amb.* vii. *t.* 5, is a pretty good figure of this; but *Tinda parua*

of the *Hortus Malabaricus, vol.* i. *t.* 49, quoted for *Morus Indica,* is no doubt König's *Trophis aspera,* and a tolerably good representation it is. Page Carey Ed.

Beng. Toot.

Sans. Toola.

I have never found this tree in its wild state, but always in gardens, or plantations, or where it had been planted. Where it is indigenous I cannot say. Flowering time the beginning of the hot weather, in February, at which time the young leaves also make their appearance, though by culture they may be continued the year round.

Trunk, when the trees are suffered to grow unmolested till they are full grown, rarely more than the thickness of a man's leg. *Branches* numerous, spreading in all directions. *Wood* pale, yellowish, hard, close-grained. *Bark* smooth, ash-coloured; the whole height of the largest trees I have seen about twenty feet. *Leaves* deciduous, alternate, petioled, ovate-cordate, long, tapering, entire, pointed, with the lateral margins serrate, and sometimes lobate and even deeply so, smooth on both sides, very various in size on the larger trees not kept cut, as in the plantations for feeding silk-worms, where they are larger and more divided, from two to four inches long, and from one to two and a half broad. *Stipules* sub-lanceolate, caducous. *Female aments* from the axills of the first leaves or from the scales of the envelope of the bud of the young shoots, solitary, short-peduncled, nearly oval, or oval. *Calyx* of four, fleshy, cuneate leaflets. *Style* single, half two-cleft; divisions tapering and villous. *Berry* about the size and shape of a small field bean; when ripe black. III. 597

This is the species cultivated in Bengal to feed silk-worms. It is kept down by frequent cutting that the branches may become more numerous, consequently the foliage more abundant, and more easily gathered. The cultivators of these bushes, do not always rear the worm. When they do not, they sell the leaves upon the tender branches to the ryots who rear the worm, but do not cultivate the mulberry, by the basket, a measure called in some parts a *Koopee,* weighing on an average, one hundred pounds avoirdupois. The average price is about three *Koopees* for the Rupee. While the worms are very young they not only strip the leaves from the twigs but cut them small. Afterwards when the worms are larger, the whole leaves upon the twigs are given, and the sticks are removed when the leaves are consumed.

The annual value of the biga which is a third of an English acre, taking the general average of markets, and also the general average of lands in point of quality of soil, may be about eight Rupees; deduct for the rent of the land two Rupees, this leaves a profit of six to the ryot for his labour. III. 598

The plant is usually cut four times in the year, and stripped of its leaves twice. The latter mode is practised during the rains, when cutting the plants would injure them, by the water penetrating the cut parts; besides, by having the branches at this season at their full length, there is less danger of their being overflowed during inundations of the Ganges.

A plantation once formed, requires no great labour to keep it in order, as the close luxuriant growth of the plants keeps the weeds pretty well under; however, it is necessary to dress the ground now and then, and to earth up the plants while young, or when the rain washes away the earth. The ground is generally so moist at all times of the year in Bengal, as to render irrigation almost unnecessary; an advantage the coast of Coromandel cannot boast of, and which will ever render it impossible for that country to cultivate silk at as low a rate as is done in Bengal. For this plant a light, rich, elevated soil is made choice of; for the Hindoo cultivators say clayey ground, or such as allows the water to settle about the roots of the plants, will not do. The plantation, they say, requires to be renewed once in three or four years, to insure a succession of the best leaves. Cuttings are employed, and planted about the close of the rains, in rows three feet asunder, and about half that distance in the rows.

5. M. *tatarica. Willd.* iv. 369.

Dioecous, arboreous. *Leaves* cordate serrate, rather obtuse, mostly entire, though sometimes sinuate, or even lobate.

This small tree I have only found in a few gardens about Calcutta, and like *Morus Indica* have never found it in its wild state, nor can I learn from whence it originally came. This sort is never, so far as I can learn, cultivated in any part of India for the silk-worm, nor for any other purpose. The fruit is very small, like that of *Indica,* and of too little estimation to encourage any one to cultivate it. Flowering time in Bengal, February. III. 599

6. M. *mauritiana. Willd.* iv. 371.

Dioecous. *Leaves* obovate oblong, entire. *Aments* cylindric.

Trophis *cylindrica. Roxb. Mss. N.* 1703.

Reported to be a native of Madagascar. Dr. Anderson of Madras received the plants from the Mauritius. In his garden they thrive well, and from thence seeds and cuttings were procured for the Botanic garden at Calcutta, in 1799, where they blossom and ripen their seed at various periods.

Trunk of the young trees in Dr. Anderson's garden, straight, and regularly clothed with spreading branches nearly to the base. *Bark* ash-coloured. *Leaves* alternate, short-petioled, obovate-oblong, entire, without pubescence, but a little scabrous, from two to three inches long by one or one and half broad. *Stipules* small, chaffy. *Aments* axillary, solitary, sub-cylindric; the *male* ones on one tree and the *female* ones on another, the latter generally recurved. *Male aments* half the length of the leaves. *Calyx* four-parted, divisions cordate, with villous margins. *Stamina* as in the genus, with double whole anthers. *Pistillum,* a four-winged rudiment of one in the centre. *Female aments* nearly the size of the male. *Calyx* four-leaved, enlarging with the germ into a fleshy covering for the single seed, which is covered

Page Carey Ed. by a crustaceous envelope. *Germ* superior, broad ovate, one-leaved, one-celled, ovulum single, attached to one side of the cell a little under its apex. *Style* or rather *stigma* two, subulate, villous on the inside, united at the base.

7. M. *paniculata. Roxb.*

Arboreous, dioecous. *Leaves* alternate, long-petioled, cordate, serrate, hoary underneath. *Panicles* axillary. *Female calyx* urceolate, entire. *Berries* round, pellucid, white.

Urtica *fruticosa. Banks's Herbarium.*

Perlarius primus. *Rumph. Amb.* iv. *t.* 56.

III. 600 A native of the Moluccas, from thence the seed came amongst the earth with the spice plants, to the Botanic garden in 1798. Now, July 1802, both male and female trees are in blossom, and about fifteen feet high.

Trunk straight. *Bark* smooth, olive-coloured. *Branches* numerous, spreading in every direction. *Young shoots* clothed with much short, soft, hairy pubescence. *Leaves* alternate, petioled, from ovate to round-cordate, three-nerved, serrate, acute, harsh, deep green above, hoary underneath, from four to eight inches long, and from two to six or seven broad. *Petioles* rather shorter than the leaves, round, downy. *Stipules* semi-cordate, lanceolate, caducous. *Panicles* axillary, solitary, with a few flexuose branches. MALE FLOWERS, hitherto they have been only found in a distinct tree, and collected in little, rather remote fascicles over the ramifications of the panicles. *Calyx* four-toothed. *Stamens* long and recurved. FEMALE FLOWERS collected in little, round, aggregate heads. *Calyx* urceolate, entire, becoming succulent. *Style* or *stigma* single, long, curved, villous. *Berry* round, size of a pea, very succulent, pure, pellucid, white when ripe, and containing many very minute seeds.

The taste of the ripe fruit is sweet, but rather insipid.

MONOECIA PENTANDRIA.

XANTHIUM. Schreb. gen. N. 1426.

Male calyx; common imbricated. *Corol* one-petalled, five-cleft, funnel-formed. *Receptacle* chaffy. *Female calyx; involucre* two-leaved, two-flowered. *Corol* none. *Drupe* dry, murexed, two-cleft. *Nut* two-celled. *Linn. Syst.*

To our Indian plant the following essential generic character suits better, viz. *Male* aggregate. *Calyx; common,* imbricated; *corollets* tubular, five-toothed. *Nectary* cylindric, antheriferous. *Female calyx* as in the male. *Corol* none. *Germ* superior, two-celled; *cells* one-seeded; *attachment* inferior. *Styles* two pair. *Drupe* dry, muricate, two-celled. *Seed* solitary.

III. 601 *Embryo* erect, without perisperm.

X. *Indicum. Kön. Mss.*

Annual, unarmed. *Leaves* reniform cordate, lobate, grossly serrate, dentate.

Sans. Aristha.

Teling. Veri-tel-nep.

Tam. Marlumutta.

A strong, robust annual, growing from two to three feet high; it delights in the banks of rivers, and rubbishy places, where it appears and flowers during the dry season only. It ought to be compared with X. *orientale*, for König thought them different, yet I suspect they are the same.

Stem erect, somewhat scabrous, clouded with dark coloured spots, annual. *Leaves* alternate, petioled, broad cordate, or rather tending to kidney-formed, somewhat lobed, notched, waved, three-nerved, scabrous; about four or five inches each way. *Petioles* round, scabrous, as long as the leaves. *Flowers* terminal, and from the superior axills. MALE FLOWERS aggregate, above the female ones, short-peduncled. *Corollets* from four to five-parted. *Nectary* tubular; *mouth* few-toothed, staminiferous. FEMALE FLOWERS below the male, sub-sessile, and solitary. *Calyx* one-flowered, many-leaved; *leaflets* lanceolate, hairy. *Germ* superior, oblong, armed with uncinate bristles, two-celled, each cell containing one ovulum enveloped in an interior tunic, a continuation of which, form the two long slender styles, which end in simple stigmas. *Perisperm* &c. as described by Gærtner.

AMARANTHUS. Schreb. gen. N. 1431.

Male calyx from three to five-leaved. *Corol* none. *Stamens* from three to five. *Female calyx* beneath, from three to five-leaved. *Corol* none. *Styles* three. *Capsule* membranaceous, one-celled, one-sided, opening horizontally. *Embryo* annular, and furnished with a perisperm.

III. 602

SECT. 1. *Triandrous.*

1. A. *tenuifolius. Willd.* iv. 4381.

Annual, diffuse. *Leaves* wedge-shaped, emarginate. *Glomerules* axillary; *male flowers* diandrous, with a two-leaved calyx; the *female* ones irregular.

Beng. Jeel Chumli.

Found during the whole year, on cultivated ground near Calcutta.

Root perpendicular, with small lateral fibres, of a bright pink colour. *Stem* none, but numerous, smooth, alternately ramous branches, spreading close on the earth; their length from six to twelve inches. *Leaves* somewhat petioled, long, wedge-shaped, emarginate, with a bristle in the fissure, are smooth, and about an inch long. *Glomerules* axillary, never termi-

nal. MALE FLOWERS with a two-leaved perianth, and two stamens. FEMALE FLOWERS more numerous than the male ones. *Calyx*, the internal flowers of the fascicle, or glomerule, have rarely any; the exterior ones have it consisting of one or two leaflets. *Capsule* with six longitudinal furrows coloured and not circumcised. Page Carey Ed.

2. A. *polygonoides. Willd.* iv. 389. and *B. H.*

Diffuse. *Leaves* obovate. *Glomerules* axillary, two-parted. *Capsule* pullate, equalling the acute lanceolate leaflets of the calyx.

Beng. Cheloo nuteepa.

Teling. Chira kura.

Is the smallest species I know. It is annual, a native of almost every soil and situation, is a common weed in our gardens, where there is a constant succession of plants flowering all the year.

Root perpendicular. *Stems* in young luxuriant plants erect, with spreading branches from the base; but more frequently there are only many prostrate branches, with alternate, bifarious, smooth branchlets, from six to twelve inches long, often coloured on the upper side. III. 603

Leaves alternate, in young plants with a stem, petioled, in others sub-sessile, oval, obovate, or wedge-formed; tapering down the petioles, pretty smooth, emarginate with a minute bristle, with *margins* tinged red, from a quarter to half an inch long. *Glomerules* axillary, two-parted, whether by a branchlet or not, never any thing like a spike. *Male flowers* most numerous. *Leaflets* of the calyx short, sharp-pointed; *stamina* three. *Capsules* longer than the calyx, bullate, with the apex coloured red. *Seed* shining black.

This species although wild, for I never saw any one that tried to cultivate it, the natives use as a pot-herb; it is reckoned exceedingly wholesome, for which reason convalescents have this species recommended to them in preference to any of the others.

3. A. *polygamus. Willd.* iv. 381.

Diffuse. *Leaves* rhomb-ovate, emarginate; *glomerules* axillary, or on terminal spikes. *Calyces* daggered, longer than the capsules.

Blitum Indicum album. *Rumph. Amb.* v. *t.* 82. *f.* 1.

Hind. Chumli sag.

Beng. Champa nuteeya, and Lal-Champa nuteeya, a reddish variety.

Teling. Dugala-kura, and Yerra-dugala kura, the reddish variety.

Wherein does A. *Blitum* differ from these?

A native of the same places with the last described, like them annual, and flowering at the same time. Both sorts are extensively cultivated all over the southern parts of Asia.

Stem when the plants are young, and in a good soil, erect, about a foot high, branchy near the base; but when old, or in a bad soil there are only several diffuse, smooth, striated, coloured branches; from nine to eighteen inches long. *Leaves* petioled, rhombiform, emarginate with a bristle, rugose, generally about an inch long. *Glomerules* axillary, very rarely on terminal, or other spikes. *Male flowers* most numerous, triandrous. *Calyx* twice the length of the capsule, leaflets awl-pointed. *Capsules* shorter than the calyx, less bullate than in A. *prostratus.* III. 604

4. A. *tristis. Willd.* iv. 385.

Erect, very ramous near the ground. *Leaves* rhomb-oval, obtuse, emarginate. *Glomerules* axillary, and on terminal spikes. *Calyces* daggered, longer than the capsules.

Teling. Qui-tota kura.

Blitum Indicum secundum. *Rumph. Amb.* v. *t.* 82. *f.* 2.

A. *campestris, Willd.* iv. 382, can be nothing more than one of the varieties of this very useful species, and it is more than likely that his A. *polystachyus, p.* 385. is another variety, if not the same. Qui-tota kura the Telinga name of A. *campestris*, (though by mistake I presume Willdenow inserts the word Tamul) is synonymous with *Kuppee-kirri*, the Tamul name of *polystachyus.*

Annual, I have never found it wild, it is held in great esteem by all ranks of the natives, and is much cultivated by them, it grows readily all the year round if watered.

Root perpendicular, coloured, reddish. *Stem* erect, below ramous, from one to two feet high, smooth, sometimes tinged red. *Branches* spreading or near the ground, as long as the stem. *Leaves* petioled, rhomb-ovate, tapering down the petiole, emarginate with a bristle, a little rugose; size very various, but in general about an inch broad. *Glomerules* axillary, and in long, terminal, erect, interrupted, green spikes (not two-parted.) MALE FLOWERS triandrous. *Leaves* of the calyx ending in an awled point, longer than the capsule.

It differs from A. *oleraceus* in having long, diffuse branches from the base, and from *Dugala kura* in having always terminal spikes; besides it may be cut down several times without destroying the plants, for they soon shoot out vigorously again; this renders it much more useful to the poorer natives, who are possessed of but a very small spot of ground, and little time to spare for its culture; besides it is in higher esteem than A. *oleraceus*, which yields but one crop. III. 605

When the plants are particularly red, which I believe is accidental, the Telingas distinguish them by the addition of the adjective *Yerra*, which means red. The plant figured is of this sort. There are other varieties besides these two.

5. A. *viridis. Willd.* iv. 388.

Ascending, ramous, from one to two feet high. *Leaves* elliptic, emarginate; *glomerules* axillary, and on small axillary branchlets. *Leaflets* of the calyces three, obtuse, and much shorter than the rugose capsules.

A native of various parts of India, appearing most frequently as a weed in gardens during

Page Carey Ed. the rainy and cold seasons. The tender tops are eaten by the natives, though not so much esteemed as the cultivated sorts.

6. A. *lividus. Willd.* iv. 386.

Erect, smooth, simple, from two to three feet. *Leaves* long-petioled, sub-ovate, retuse. *Glomerules* axillary, and on a terminal spike. *Calyces* from three to five-leaved, obtuse, which, with the bractes, are shorter than the round, compressed capsules.

Beng. Gobura *nu*teeya.

It is cultivated as a pot-herb. The stem is generally simple, from two to three feet high, polished, of a bright red colour, as are also the petioles, the leaves of dull greenish purple, with brighter coloured nerves, and veins. The bractes are shorter than the capsule; as are also the leaflets of the calyx; which with the broad, retuse leaves, make this species readily distinguished from all the rest.

7. A. *oleraceus. Willd.* iv. 386.

III. 606 Erect, with a few branches above the middle. *Leaves* from broad rhomboidal, to ovate lanceolate. *Glomerules* axillary, and on a terminal spike. *Calyces* cuspidate, and rather longer than the rugose capsules.

Teling. Tota-Kura.

Beng. Sada-*Nu*teeya.

The figure which Willdenow, in his *Historia Amaranthorum*, gives for *oleraceus*, does not by any means agree with what König and myself have always considered to be that plant. His *inamoenus* is much more like it; if the leaves were emarginate, it would be a very excellent representation of this species. There are several varieties cultivated as pot-herbs over India, particularly on the coast of Coromandel. The most conspicuous, after the common green sort, particularly referred to in the above definition are,

1*st.* Yerra-tota Kura of the Telingas, a very beautiful variety, with a clear bright red stem, branches, petioles, nerves, and veins, and the leaves themselves rather ferruginous.

2*nd.* Tella-tota Kura of the Telingas; here all the parts that are red in the last variety are of a clear, shining, white colour.

3*rd.* Rosa or Pedda-tota Kura of the Telingas, is a very large variety, which König called A. *giganteus*. In a rich soil it grows to from five to eight feet high, with a stem as thick as a man's wrist. The tender succulent tops of the stem and branches are sometimes served up on our tables, as a substitute for *asparagus*.

The other varieties are more changeable, and not so well marked; I will not therefore take notice of any more of them.

8. A. *gangeticus. Willd.* iv. 384.

Erect, with sub-erect branches issuing out above the middle of the stem. *Leaves* rhomb-ovate. *Glomerules* axillary, as well as on single axillary, and compound, terminal spikes. *Calyces* three-leaved, which with the bractes are cuspidate and longer than the slightly rugose capsules.

III. 607 The varieties of this useful species cultivated in Bengal alone are endless; and are in general known by the Hindoo name Lall Sag, or Dengua of the Bengalees. They are in more general use amongst the natives of Bengal than any other species, or variety.

In the above definition, I have aimed at including the whole, at least all that have fallen under my observation. They, as well as *oleraceus* and its varieties, differ most conspicuously from the other two extensive tribes of cultivated amaranths, viz. *polygamus* and *tristis*, and their varieties, in not admitting of being cut, with the hope of succeeding crops from the same root, but are pulled up by the root, and carried to market in that state.

The varieties are tolerably permanent, and differ in colour chiefly, which varies from green, with the slightest tinge of red, to rufous, liver coloured, and bright red. One variety has particularly broad leaves, with the margins green, and the centre dark purple. It is a handsome plant.

9. A. *lanceolatus. R.*

Straight. *Leaves* lanceolar, plain green; *glomerules* triandrous, axillary. *Calyx* daggered, longer than the swelled, rugose capsules.

Bans-*pu*ta *nu*teeya, *i. e.* Bamboo-leaved amaranth, of the Bengalees.

A native of Bengal. I do not remember to have seen it on the Coromandel coast. Flowering time the rainy season.

Stem perfectly straight, with nearly erect, smooth branches; height in a good soil as far as from five to six feet. *Leaves* alternate, long-petioled, lanceolar, tapering much towards each end, rather obtuse at the point, with a bristle, from two to eight inches long. *Petioles* channelled by the decurrency of these leaves, and nearly of their length. *Glomerules* axillary, never any thing like a terminal spike, which circumstance alone distinguishes it from *oleraceus*, and all its varieties. *Bractes* numerous and like the calyx. *Calyx* of both male and fe-
III. male flowers three leaved; *leaflets* lanceolate, daggered, membranaceous, with a green keel.
608 Male flowers with three stamens. *Anthers* sagittate. Female ones with three tapering styles. *Capsule* circumcised, wrinkled. The leaves and tender tops are eaten by the natives in their curries.

10. A. *atropurpureus. R.*

Erect, ramous, from three to six feet high. *Leaves* lanceolar, of a deep liver colour, above of a shining crimson, underneath purple. *Glomerules* axillary, as well as on a glomerate, terminal spike. *Calyx* three or five-leaved, cuspidate, and longer than the rugose capsules.

Bans-*pu*ta lal *nu*teeya of the Bengalees who cultivate this sort also as a pot-herb. It appears to me to be a well marked, very distinct species, which I have not found altered by change of soil.

11. A. *tricolor. Willd.* iv. 383. Page Carey Ed.

Erect, from two to four feet high. *Leaves* approximate, broad rhomb-lanceolate, variously coloured. *Glomerules* axillary, large, half stem-clasping. *Calyces* of the three cuspidate leaflets, which are longer than the capsules. Common in gardens all over India and China. In Bengal it is in flower and seed the whole year.

12. A. *melancholicus. Willd.* iv. 383.

Erect, ramous, from six to twelve feet. *Leaves* remote, rhomb-ovate, coloured. *Glomerules* axillary. *Calyces* of three, cuspidate leaflets, which are longer than the capsules.

Found in gardens all over India; flowering time the rainy and cold seasons.

The last two species *melancholicus* and *tricolor*, differ fully as much in our gardens as any two species of the genus, not only in colour, but in size and habit. The former grows to be from six to twelve feet high during the rains, is ramous, and pyramidal, with the leaves more remote, much broader, and with rarely more than two colours, viz. a dull livid purple, and a most lively light crimson, one half of a few of the latter colour, white the other half, and all the lower leaves are of the former. Whereas A. *tricolor*, growing in the same soil, &c. rises to only three or four in height, with generally a simple, erect stem, and numerous, variegated, narrower leaves with very long glomerules of flowers in their axills. III. 609

I have not hitherto been able to find any Asiatic synonyms for either of these; Sir William Jones supposes the Sanscrit name, *Vastuca*, may belong to an *Amaranthus*, but to what species is uncertain.

13. A. *fascicatus. R.*

Erect, ramous above the middle. *Leaves* rhomb-ovate. *Panicles* terminal, composed of a few simple, cylindric branches. *Bractes* minute, shorter than the obtuse, three-leaved calyx, which is shorter than the rugose capsules.

Bun or *tuntuni* nuteeya of the Bengalees.

Chilaka tota Kura of the Telingas.

A common weed, and green in every part, with the exception of a crescent-shaped cloud or fillet of paler green crossing the centre of the leaves.

SECT. II. *Pentandrous.*

14. A. *hybridus. Willd.* iv. 389.

Erect, from two to three feet high, *Leaves* rhomb-lanceolar. *Racemes* naked, panicled, erect. *Leaflets* of the calyces three, rather obtuse, covering the very rugose capsules.

Introduced into Bengal from Persia, where it is indigenous.

15. A. *frumentaceus. Buchanan.*

Pentandrous, annual. *Stem* and *branches* erect. *Leaves* broad-lanceolar. *Panicles* erect. *Leaves* of the calyx daggered. *Capsules* wrinkled, seed pellucid, with callous white margins. III. 610

First discovered by Dr. Buchanan, on the hills between the Mysore and Coimbetore countries, where the natives call it *Kiery*, and cultivate it for the seed which they convert into flour, and which forms a great part of their subsistence.

In the Botanic garden forty square yards of ground, sown with this plant in June, yielded twenty-one pounds weight of the clear ripe seed in September. It also grows well during the cold season, viz. from October till February inclusive.

Root annual. *Stem* erect, often an inch or more in diameter, with numerous, erect branches from every part, more or less striated, otherwise perfectly smooth, colour from green to pretty deep red; height of the whole plant from one to seven feet according to the season. *Leaves* alternate, pretty long-petioled, from oblong to broad-lanceolar, acute, variously coloured like the stem and branches. *Panicles* terminal, each branch of the plant ending in a straight subcylindric one, composed of many appressed, crowded spikes. In short, the whole plant is so loaded with the inflorescence, as to appear almost a single, large panicle. *Calyx* longer than the stamens: *leaflets* in both male and female with subulate points. MALE FLOWERS with five stamina. The FEMALE ones with from two to three styles. *Capsule* rugose. *Seed* solitary, round, a little compressed, pellucid with a white margin.

16. A. *cruentus. Willd.* iv. 892.

Erect, ramous, from four to six feet high. *Leaves* long-petioled, broad lanceolar. *Panicles* terminal, crowded with erect, compound, and decompound branches. *Calyx* of five rather obtuse leaflets, which are shorter than the capsules.

A large, stout, ramous, erect, gaudy species; which blossoms earlier in the rains than the ornamental sorts, and does not vary in colour in our gardens in India; being of a pale green tinged with red, and the panicles which are from one to two feet long, crimson. The leaves are very remarkable for being concave, like a spoon, either on the upper or under side, occasioned by the margin being considerably contracted. III.

17. A. *spinosus. Willd.* iv. 393. 611

Erect, ramous, round, with sharp spines in the axills of the leaves. *Spikes* terminal, simple, with sessile, axillary glomerules.

Teling. Mulloo tota Kura.

Beng. and *Hind.* Kanta nuteeya.

A very troublesome weed, particularly during the rainy and cold seasons.

MONOECIA HEXANDRIA.

PHARUS. Schreb. gen. N. 4. 1434.

Male calyx; *glume* two-valved, one-flowered. *Corol*; *glume* one or two-valved. *Female*

Page Carey Ed. *calyx; glume* two-valved one-flowered. *Corol; glume* one or two-valved. *Style* single. *Stigma* three; *seed* solitary.

P. *urceolatus. R.*

Panicles umbelled; both male and female flowers peduncled, and with a one-valved, pitcher-shaped corol.

A native of Pulo Pinang.

Root creeping, perennial. *Leaves* bifarious, petioled, broad-lanceolate, smooth on both sides, and entire; from four to five inches long, and from one to two broad. *Petioles*, lower portion sheathing; above the sheathing portion, which ends in a bearded mouth, there remains about one inch, which is concave within. *Racemes* digitate, each bearing from four to six female flowers, all pedicelled; the lower, and upper ones accompanied with a male flower each, so that there are only two males to the spike. MALE FLOWERS. *Calyx; glume* two-valved, one-flowered. *Corol; glume* one-valved, opening on one side from the apex. *Filaments* six, the length of the corol. *Anthers* linear, there is only the rudiment of a three-pointed germ.

III. 612 FEMALE FLOWERS. *Calyx; glume* two-leaved, one-flowered. *Corol; glume* one-valved, pitcher-shaped, with a small round opening at the apex; hairy on the outside. *Nectary* two filaments from the base of the corol on the inside, and of about its length. *Germ* conical. *Style* length of the corol. *Stigmas* three, woolly.

LEUCOCEPHALA: R.

Flowers, male and female, aggregated in a globular head, with a common calyx of five, or many leaflets, and a chaffy receptacle. *Male perianth proper* one-leaved. *Corollets*, or *tube* of the filaments, six-cleft; *divisions* subulate, bearing the anthers on their apices. *Female proper perianth* from two to three-leaved. *Corollets* three-petalled. *Style* three-cleft. *Capsule* superior, tricoccus.

1. L. *graminifolia. R.*

Leaves ensiform. *Common calyx* five-leaved.

Eriocaulon *quinquangulare. Willd.* i. 485.

Beng. Goori.

The figure referred to in Pluckenet, viz. *t.* 221. *f.* 7, agrees well with this species, and I doubt the possibility of distinguishing it from *sexangulare* by the scape, particularly in the dry specimens, as I could never do it with the living plant, so that I conclude some other specific character must be looked for, such as I have ventured to give.

It is a common annual, in wet cultivated places in most parts of India, appearing about the close of the rains.

Leaves few, radical, sword-shaped. *Scape* erect, naked, from three to six inches, striated lengthways. *Head* of corollets aggregate, globular, white from little filaments on the apices of the scales of the receptacle. *Calyx, common* of five, oval leaflets. *Male florets* chiefly in the centre, short-pedicelled. *Perianth, proper* one-leaved, wedge-shaped, emarginate, placed on

III. 613 the inside, and inserted on the proper pedicel of the corollets, gaping on the outside, and there covered by a large chaffy, dark-coloured, wedge-shaped scale, the apices of both white with small filaments. *Florets* one-petalled, funnel-shaped; *border* of six subulate divisions. *Filaments* no other than the divisions of the border of the florets every alternate one broader, and with a bearded process near the middle on the under side. *Anthers* six, resting, incumbent on the apices of the divisions of the florets, blue. *Pistillum* no other than a three-lobed gland in the mouth of the tube. *Female florets* most numerous, and chiefly in the circumference, short-pedicelled. *Perianth proper* from two to three-leaved, but the scales of the receptacles as in the male. *Florets* of three, filiform, white petals. *Stamens* none. *Germ* superior, three-lobed. *Style* three-cleft. *Stigmas* recurved. *Capsules* three-lobed, three-celled. The extreme delicacy of the partitions may render their presence doubtful. *Seed* solitary, oval, affixed by the apex. *Receptacle* globular, chaffy, with some hairs interspersed; the chaff or scales are numerous, of which one always embraces the under side of each floret, but there are many more of them than florets.

Note. The generic character of *Eriocaulon* must have been taken from other species, for this has not the smallest affinity to it.

2. L. *spathacea. R.*

Leaves spathiform. *Common calyx* many-leaved.

Eriocaulon *sexangulare. Willd.* i. 485.

A native of the same places with L. *graminifolia*, and differing from it in the following points only.

1*st.* In this the leaves are shorter, broader and embracing from three to four culms, so that they are more like common spathes than leaves. In that they are simple, sword-shaped.

2*nd.* In this the common calyx is composed of about twenty leaflets. In that five-leaved.

Besides, in the specimens of this which I have examined, the scales of the heads of corollets are naked. In that they are clothed with small delicate, white filaments.

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COCOS. Schreb. gen. N. 1692.

Male calyx three-leaved. *Corol* three-petalled. *Filaments, calyx* five leaved. *Corol* three-petalled. *Germ* superior, three-celled; *cells* one-seeded; *attachment* superior. *Stigma* three-lobed. *Drupe* coriaceous. *Embryo* in the base of the perisperm.

C. *nucifera. Willd.* iv. 400. *Corom. pl.* i. *N.* 73.

Unarmed. *Fronds* pinnate; *leaflets* plaited, nuciform. Page Carey Ed.
Tenga. Rheed. Mal. i. *t.* 1, 2, 3, 4.
Calappa. *Rumph. Amb.* i. *t.* 1, 2.
Neriula. *Asiat. Res.* iv. *p.* 312.
Sans. Narikela, Narikelee.
Hind. Naryel, or Nariel.
Beng. Narikel.
Cocos Nucifera. *Linn.*
Teling. Nari Kudum, or Kobri-Chulloo.
Tam. Tenga.

This tree is too well known to require a description; its generic character, that of the East Indies I mean, (that of the West Indies may be different,) differs a little from the description of the last edition of the *Genera plantarum*, viz. *Schreber's.*

Spathe universal, axillary, cylindric, oblong, tapering equally towards each end, bursting longitudinally its whole length; texture somewhat woody; perfectly smooth on the inside, slightly striated lengthways on the outside, from two to three feet long. *Spadix* nearly erect, very branchy, flexuous. *Branches* thereof simple, flexuous, bowing a little. MALE FLOWERS numerous, above the female ones, approximated, sessile. *Calyx* three-leaved, leaflets small, broad-cordate, firm, fleshy. *Petals* three, as in the *Genera plantarum.* FEMALE FLOWERS generally one, though sometimes there is one near the base of each ramification of the spa- III.
dix, and accompanied by a male flower on each side. *Calyx* inferior, five-leaved, the exterior 615
two small, and may be called bractes. *Corol* three-petalled, if five are allowed for the calyx, cordate, smaller than the inner three leaflets of the calyx, of a firm leathery texture, concave, and not expanding, except in a trifling degree, unless force be used. *Nectary* a thin orange-coloured ring surrounding the base of the germ. *Germ* somewhat conical. *Style* none. *Stigma* small, immersed in the apex of the germ slightly three-lobed.

The nut is well described and delineated by Gærtner. Of this valuable, and very elegant tree, there are several varieties, if not distinct species, cultivated near the shores of India. They do not thrive at any distance from the sea. Flowering time the hot season; the nuts ripen about the close of the rains, or beginning of the cool season in October or November. The uses of this tree and its produce are numerous, and well known.

ARECA. Schreb. gen. N. 1696.

Male calyx three-parted. *Corol* three-petalled. *Female calyx* three-leaved. *Corol* three-petalled; *nectary* six-toothed. *Germ* superior, one-celled, one-seeded; *attachment* inferior. *Drupe* coriaceous. *Seed* single, ruminate. *Embryo* in the base of the perisperm.

1. A. *catechu. Willd.* iv. 524. *Corom. pl.* i. *N.* 74.

Trunk straight, and slender, from forty to fifty feet high. *Fronds* pinnate; *leaflets* compound, linear, opposite, præmorse. *Spathe* erect, ramous. *Male flowers* hexandrous. *Seed* of a roundish conic form and obtuse.

Areca *faufel. Gært. Fruct.* i. 19. *t.* 7. *f.* 2.
Pinanga. *Rumph. Amb.* i. 1. 4.
Caunga. *Rheed. Mal.* i. 5. 8.
Sans. Goovaka.
Guvaca. *Asiat. Res.* iv. *p.* 312.
Pers. and *Hind.* Soopara. III.
Arab. Foolful. 616
Beng. Gooa.
Teling. Poka chelloo.

Where this tree grows wild I cannot say from my own observation, but it is cultivated in all the warmer parts of Asia, and is in flower most part of the year. It is the most beautiful palm we have in India. The trunk grows remarkably straight, often from forty to fifty feet high, and in general about twenty inches in circumference, equally thick in every part, and smooth, but the tree is so well known, and fully described, that I should not have thought of mentioning it, had I not found that its family character was imperfectly known.

Male and *female flowers* are in the same spadix. *Spathe* double. *Spadix* very branchy. MALE FLOWERS very numerous, about the female ones, sessile, without bractes. *Calyx* one-leaved, small, three-cornered, three-parted, smooth. *Petals* three, oblong, rigid, striated, smooth, many times longer than the perianth. *Filaments* generally three, very short and broad, two-parted, inserted round the base of the abortive germ. *Anthers* always six, sagittate. *Germ* no other than a short culm, which splits into three short, obtuse segments. FEMALE FLOWERS one, two, or three, at or near the base of each ramification of the spadix, sessile without bractes. *Calyx* three-leaved; *leaflets* cordate, rigid, fleshy, permanent. *Corol* three-petalled, like the calyx, and permanent. *Nectary* membranaceous, generally six-toothed, embracing closely the base of the germ. *Germ* oval. *Style* scarcely any. *Stigmas* three, short, triangular. The *drupe* is well described, and delineated by Gærtner, *vol.* i. *p.* 19. *t.* 7. *f.* 2.

On the Malabar coast the common black pepper vine is usually trained up to this tree, which renders it more useful in those parts, than any other.

2. A. *Dicksonii. Roxb.* III.

Fronds pinnate; *leaflets* ribbed, with præmorse ragged apices. *Spadix* axillary, ramous, 617
retrofracted, branches thereof with alternate, distichous fascicles of two male, and one female flowers, the former polyandrous, the latter with a six-horned nectary. *Fruit* oblong.

Page Carey Ed.

A native of the mountains of Malabar, where it was found by Dr. Dickson, both in flower and ripe fruit in the month of August. It grows to the height of about sixteen or eighteen feet, with a very straight, simple trunk, of about two inches in diameter.

Leaves pinnate, about four feet long, with extremities bifurcate, like the tail of a swallow. *Leaflets* sessile, linear, ribbed, with numerous parallel veins, apices præmorse, dentate; from twelve to twenty-four inches long. *Spathe* simple. *Spadix* compound, retrofracted; *ramifications* from four to eight, alternate, simple, equal, distichous; from six to eight inches long. *Flowers* numerous, approximate, alternate in two exactly opposite rows, a single female in the centres, with a single male on each side. MALE FLOWERS. *Calyx* three-cleft, division subulate nearly as long as the corol. *Corol, petals* three, cordate, with slender tapering apices. *Filaments* very short. *Anthers* from twenty to thirty, linear. FEMALE FLOWERS. *Calyx* of three reniform leaflets. *Corol* like the calyx. *Nectary*, six clavate, hairy headed scales. *Germ* superior. *Style* short. *Stigma* three-lobed. *Berry* oblong, dry and fibrous, about an inch long, by half an inch in diameter. *Seed* of the shape of the berry, ruminated. *Embryo* lodged in the base.

Mr. Dickson, the Surgeon at Bedanore, who first brought the plant under my observation, observes that the nut is used by the poorer people, as a substitute for the common *Areca*, but no other part of the tree is turned to any useful purpose.

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3. A. *triandra*. *R.*

Arboreous, stoloniferous. *Fronds* pinnate; *leaflets* compound, præmorse. *Spadix* ramous, erect. *Male flowers* triandrous. *Fruit* oblong.

Beng. Bun-gooa.

A native of Chittagong, where it was first observed by Dr. Buchanan, who sent plants of it to the Botanic garden at Calcutta in 1797. In 1808 the largest plant was in flower from May till January, and the seeds of the first blossoms were ripe in April 1809.

Trunk perfectly straight, in our eleven or twelve years old plants about seven feet high, A. *catechu* would have been triple that height in the same time, quite simple, seven inches in circumference, perfectly round, and smooth, except the circular marks of the fallen leaves. *Fronds* pinnate, from four to five feet long. *Leaflets* sub-alternate, linear, præmorse, two or more toothed, or ending in one centre, ensiform, smooth, plaited, from two to three feet long. *Spathe* smooth, convex underneath, length from the top of the sheath to the leaflets, from three to four inches, and there channelled, beyond this portion a sharp high ridge. *Spathe* cylindric, smooth, about a foot long. *Spathe* simple, axillary, linear-oblong, smooth; the outside convex, the inner concave, with a sharp edge all round, and opening by a longitudinal slit on the middle of the inside, caducous. *Spadix* erect, short, decompound. *Ramifications* both first and second bifarious, alternate, patent. MALE FLOWERS sessile, very minute, one on each side of every female, and numerous over the filiform extremities of the secondary ramifications of the spadix. *Calyx* very minute, three-leaved. *Petals* three, tapering obliquely. *Filaments* three, very short. *Anthers* sagittate. *Germ* a slender, cylindric column in the centre. FEMALE FLOWERS few, alternate, sessile, below the middle of the same ramifications, much larger than the male ones. *Calyx* three-leaved; *leaflets* oval, hard, concave. *Petals* three, longer than the calyx, oval. *Nectary*, six very small scales round the base of the germ.

III. 619

Germ oblong, one-celled, containing a single ovulum, and sometimes one or two abortions attached to the bottom of the cell. *Style* none. *Stigma* conic, and composed of three, small, unequal, conic lobes. *Berry* oblong, of the size of an olive, but longer, smooth, when ripe of a lively orange, becoming red. *Pulp* in small quantity, and mixed with many longitudinal, strong, ligneous fibres, one-celled. *Seed* conform to the berry, much ruminated as in *catechu*, and with embryo lodged in its very base.

4. A. *gracilis*. *R.*

Leaves pinnate; *leaflets* few, plaited; lower pairs falcate, alternate, acuminate, the terminal pair præmorse. *Spadix* axillary, simple, retrofracted, with flowers on all sides; *male* polyandrous. *Seed* oblong.

Beng. Gooa soopari, and Ramgooa are the vernacular names at Silhet.

An elegant, tall, slender species, a native of the hills of Chittagong, Silhet, and the east border of Bengal, where it blosssoms during the hot season; and the seed ripens in October.

Trunk erect, straight, marked with the circular scars of the fallen leaves, about as stout as a walking cane, and from six to ten feet high. *Leaves* alternate, pinnate, smooth, about three feet long. *Leaflets* from three to four pair, opposite or sub-alternate, plaited, from two to three inches broad, and from twelve to eighteen inches long, lower pairs falcate, with the exterior half tapering to a very long, fine point, exterior pair shorter, linear, and præmorse, with each of the plaits ending in a bifid point. *Petioles* somewhat triangular, with a vaginated base. *Spathe* one-leaved with a bifid apex, opening down the interior or concave side. *Spadix* axillary, generally simple, retrofracted, completely clothed on all sides with male and female flowers, viz. for every female two males, one on each side. *Male calyx* minute, three-cornered. *Petals* three, obliquely cordate, acute, many times longer than the calyx. *Stamina* numerous,

III. 620

shorter than the corol. *Female calyx* and *corol* of three equal leaflets, and petals each. *Nectary* none. *Germ* oval, one-celled; *ovula* solitary, attached to the bottom of the cell. *Style* shorter than the germ. *Stigma* large, infundibuliform, with ragged edges. *Drupe* oblong, obtuse pointed, scarcely so long as a field bean; the fibrous pulp covered with a thin, smooth skin. *Seed* solitary, oblong, with the base a little oblique. *Integument* single, brown, somewhat spongy, and adhering firmly to the perisperm, into which it enters as in the common *Areca*. *Perisperm* conform to the seed. *Embryo* simple, ovate, lodged in the base of the perisperm.

5. A. *disticha. Roxb.*

Page Carey Ed.

Fronds furcate. *Spadix* axillary, simple, retrofracted, distich. *Male flowers* dodecandrous. *Female* without nectary. *Fruit* ovate.

A native of the shady forests of Pulo Pinang, where it was found by Mr. W. Roxburgh.

Stem about as thick as a common rattan, marked with the annual cicatrices of the fallen fronds, from twenty-four to thirty-six inches high. *Fronds* forked, nerves many, simple and parallel, smooth on both sides; *apices* of the two divisions obtuse, and ending in as many slender points, as there are nerves in the upper portion of the divisions; whole length about twelve or fifteen inches. *Stipes* sheathing. *Spathe* one-leaved, opening on the inside, caducous. *Spadix* solitary, on the inside of the sheath of the stipe, and hid by it till it falls off, simple, distich, by the time the flowers expand retrofracted, flexuose, woolly, from two to three inches long. *Flowers* sessile. The *female* ones solitary, on the projecting angles of the rachis, with a single male on each side of each female. *Male calyx* three-leaved, or deeply three-cleft, small. *Corol; petals* three, unequal, obliquely ovate, peltate, much longer than the calyx. *Filaments* about fifteen, short. *Anthers* linear. *Female calyx* or *corol*, or both, six-leaved. *Leaflets* nearly equal, ovate, or nearly round, concave. *Nectary* none, or no rudiments of filaments. *Germ* oval. *Style* none. *Stigma* a large scabrous gland. *Drupe* ovate, smooth, when ripe orange red; *pulp* in a small quantity, and replete with fibres. *Seed* ovate, with a clear horny texture, scarcely ruminate, with the embryo lodged in the base.

III. 621

BENTINCKIA. Berry's MSS.

Spathe universal, one-valved. *Spadix* ramous. *Male calyx* three-toothed. *Corol* three-petalled. *Female calyx* and *corolla* as in the male. *Nectary* six-leaved, *(abortive filaments.)* *Germ* superior, three-celled, one cell fertile, and one seeded; *attachment* interior. *Berry* spherical, succulent, one-seeded. *Embryo* lodged in the base of the perisperm.

B. *Condapanna. B.*

Tam. Conda-pana.

An elegant, very slender palm, of about twenty feet in height with pinnate leaves, as in the coconut tree, and large decompound, lateral spadices below the leaves. Dr. Berry found it on the mountains of Travancore and observed only male, or male hermaphrodite flowers in some, and female ones only on others. Flowers in June, and the seed ripens in about eight or nine months afterwards.

WRIGHTEA. R.

Spathe many-leaved. *Spadix* ramous. *Male perianth proper* one-leaved, entire. *Corol* one-petalled, trifid. *Female calyx* double, the exterior one two-leaved, the interior one three-parted. *Corol* one-petalled, trifid. *Germ* from two to three-celled; *cells* one-seeded; *attachment* inferior. *Berry* with from one to three seeds. *Embryo* dorsal.

1. W. *caryotoides. R.*

Chilputta, or Belputta, it is called at Chittagong, where the plant is found indigenous, blossoming in July. The seed ripens during the cold season.

III. 622

Trunk scarcely any, until the plant blossoms, and then it may be called the base of the spadix, rising above the fibrous margined sheaths of the fronds. From the base numerous shoots continue to spring, which renders propagation easy. *Leaves* or *fronds*, few, alternate, petioled, from three to eight feet long. *Leaflets* sessile, variously disposed; on the lower half of the stipe they are generally in opposite fascicles, of two or three, those further in are for the most part single, and alternate; all are wedge-shaped; lateral margins entire, apices praemorse at very various distances from the base, and jagged with the sharp points of the numerous parallel, fine fibres which run up through the substance of the leaflets; upper surface smooth, of a shining deep green, whitish underneath, general length about one foot or fifteen inches. *Petioles* or *stipes* at the base, sheathing, the rest sub-cylindric, tapering a little, while young covered a little with a large portion of a brown mealy substance. *Spadix* terminal, many-leaved. *Leaflets* of various sizes, and of a soft delicate, leathery texture, striated lengthways, covered on the outside with mealy matter, smooth on the inside, general length about that of the spadix. MALE FLOWERS very numerous over every part of the branches of the spadix, small, pale, of a yellowish white. *Perianth* cylindric, one-leaved, almost solid, there being only an excavation in the apex for the reception of the corol; margin marked with three small protuberances; smooth on both sides. *Corol; petals* three, lanceolate, smooth, fleshy. Nothing like a nectary, nor germ to be seen. *Filaments* six, short, inverted on a small, hollow receptacle in the centre of the corol. *Anthers* linear. FEMALE FLOWERS few, and amongst the male near the base of the branches of the spadix. *Perianth* may be called double, in that case the exterior one is of two, reniform leaflets; the interior one one-leaved, cup-shaped, with the border three-parted. *Corol* as in the male. *Stamina* nothing like any, nor is there any nectary. *Germ* superior, ovate, two, rarely three-lobed; two, rarely three-celled with one ovulum in each attached to the lower and inner angles of the cell. *Style* none. *Stigma*, a two or three-lobed, conical, brown point. *Pericarp*, a dry, ovate oblong berry, about the size of a nutmeg, two, rarely three-celled, three seems the natural number, though two is most common. *Seeds* solitary, ovate-oblong, about the size of a large coffee bean. *Integument* single, thin, brown, veined, adhering firmly to the peri-sperm. *Perisperm* horny, of one uniform pale colour. *Embryo* in the back of the seed.

III. 623

The name which Dr. Roxburgh has given to this genus is in honour of William Wright,

Page Carey Ed. M.D.F.R.S. and President of the College of Physicians of Edinburgh. The plant formerly named after this eminent Physician and Botanist, being found to be a species of *Blakea.*

SAGUS. Gœrt.

Spathes many, *Spadix* (terminal) super-decompound. *Male calyx* three-toothed. *Corol* three-parted. *Stamina,* inserted on the base of the corol. *Female calyx* and *corol* as in the male. *Stamina* abortive. *Style* three-parted. *Berry* backwardly imbricated with cartilaginous scales. *Seed* solitary. *Embryo* lateral.

1. S. *inermis. R.*

Arboreous, unarmed. *Embryo* lodged in or near the apex of the seed. *Leaves* pinnate.

S. lævis. *Rumph. Amb.* i. *p.* 76.

A native of Sumatra and Borneo, and of the Islands between them; growing spontaneously in low swampy lands. From the pith of the tree the granulated *Sago* which we meet with in Europe is made. The Malays themselves prefer the *Sago meal of Sagus spinosus,* (*Lapia-tuni,* or genuine Sago tree of Rumphius.) See *Herbar. Amb.* i. *p.* 75.

2. S. *Rumphii. Willd.* iv. 404.

III. 624 Arboreous, armed, with strong straight spines. *Leaves* pinnate.

S. *farinifera. Gœrt. Sem.* ii. *p.* 186. *t.* 120. *f.* 3.

S. sive Palma fariuaria. *Rumph. Amb.* i. *p.* 72. *t.* 17, 18.

Sago Palm. *Annals of Botany,* i. *p.* 193. *t.* 4.

A native of the Peninsula of Malacca, and the Malay Islands.

Like the Banana and Plantain it propagates itself by suckers from the roots of the old trees, the seed is therefore in general abortive. This, the Malay Sago Palm, is the tree, the pith of which is the staff of life to the inhabitants of the Moluccas.

MONOECIA POLYANDRIA.

CERATOPHYLLUM. Willd.

Male calyx many-parted. *Corol* none. *Stamina* sixteen, or more. *Female calyx* many-parted. *Corol* none. *Pistillum* single. *Style* subulate. *Nut* one-seeded.

C. *verticillatum. R.*

Leaves verticelled, twice dichotomous. *Leaflets* of the male calyx bidentate, of the female one entire. *Style* twice as long as the germ. *Fruit* three-horned.

Beng. Jhaunji.

Found in pools of sweet water in the vicinity of Calcutta during the dry season.

CARYOTA. Schreb. gen. N. 1701.

Male calyx three-leaved. *Corol* petalled. *Female calyx* and *corol* as in the male. *Germ* superior, three-celled; *cells* one-seeded; *attachment* inferior. *Stigma* sub-peltate. *Berry* from III. one to two-seeded. *Embryo* near the vertex of the perisperm.

625 C. *urens. Willd.* iv. 493

Unarmed. *Leaves* bipinnate; *leaflets* alternate, wedge-shaped, obliquely præmorse.

Teling. Jeeroogoo.

Saguaster Major. *Rumph. Amb.* i. *t.* 14.

Schunda pana. *Rheed. Mal.* i. *t.* 11.

A native of the various mountainous parts of India, where it grows to be one of the largest and most charming of this beautiful tribe, or natural order. Flowering time the hot and rainy seasons.

Trunk straight, often sixty feet high, thick in proportion, columnar, and marked slightly with the annular cicatrices of the petioles. It grows about as fast as the coconut tree, when in a soil and situation congenial to its nature. *Leaves* pinnate. *Leaflets* sub-alternate, sessile, obliquely præmorse; the præmorse part much jagged with sharp points. *Spathe* many-leaved. *Spadix* pendulous, from six to sixteen feet long, branchy; *branches* simple, from four to eight feet long, pretty thickly covered with innumerable sessile flowers, and these most regularly disposed in threes; one male on each side, and a single female between them. *Male calyx* three-leaved, cup-form; *leaflets* unequal, concave, of a very firm texture, permanent. *Petals* three, much larger than the calyx, elliptic, concave, of a firm leathery texture, green on the outside, whitish on the inside. *Filaments* numerous, very short. *Anthers* linear. *Female flowers* on the same spadix. *Calyx* and *corol,* as in the male. *Stamens* and *nectarial filaments* three, between the corol and base of the germ, each ending in a glandular enlarged apex. *Germ* superior, three-sided. *Style* none. *Stigma* small, two-cleft. *Berry* roundish, one-celled, of the size of a nutmeg, covered with a thin, yellow, acrid bark, but nothing that deserves the name of pulp. *Seed* or *nut* generally solitary.

III. 626 This tree is highly valuable to the natives of the countries where it grows in plenty. It yields them, during the hot season, an immense quantity of toddy or palm wine. I have been informed that the best trees will yield at the rate of one hundred pints in the twenty-four hours. The pith or farinaceous part of the trunk of old trees, is said to be equal to the best Sago; the natives make it into bread, and boil it into thick gruel; these form a great part of the diet of those people; and during the late famine, they suffered little while those trees

lasted. I have reason to believe this substance to be highly nutritious. I have eaten the gruel, and think it fully as palatable as that made of the Sago we get from the Malay countries. Page Carey Ed.

SAGUERUS. R.

Male calyx three-leaved. *Corol* three-petalled. *Female calyx* five-leaved. *Corol* three-petalled. *Germ* superior, three-celled; *cells* one-seeded, attached to the base of the axis. *Style* none. *Stigma* tridentate. *Berry* three-celled, with a single seed in each cell. *Embryo* in the back of the perisperm.

S. *Rumphii. Roxb.*

Palma Indica vinaria secunda, Saguerus, sive Gomutus Gomuto. *Rumph. Amb.* i. *p.* 57 *t.* 13.

Anou. *Marsden's History of Sumatra, p.* 77.

Aringa *Saccharifera of Labilliardiere.*

Borassus *Gomutus. Lourier. Cochin Ch.* 759.

This beautiful and stately palm appears to be indigenous in all the Islands to the eastward of the Bay of Bengal, several of the plants were introduced into the Company's Botanic garden at Calcutta by Colonel Kyd, about twelve years ago; and now, (December 1799,) two, three or four of the largest of them have been in blossom for these two years past.

Trunk straight, as yet short, and covered entirely with sheaths of the fronds, and the black horse-hair-like fibres, called by the Malays *Ejoo*, which issue in great abundance from the margins of those sheaths. As the trees advance in size and age, these drop off, leaving an elegant, columnar, naked trunk, as described by Rumphius. The whole height of the largest of the trees in the Botanic garden, including the leaves, about forty feet; the trunk rises fifteen or twenty feet, and the rest is made up by the fronds or leaves alone. *Fronds* pinnate, from fifteen to twenty-five feet long. *Leaflets* sessile, approximated, numerous, opposite, also alternate, sword-shaped, their greatest breadth being near the base; a blunt barbed process on one, or both sides of the base, accounts for their greatest breadth being there; numerous parallel fibres run lengthways on each side of the large, middle, four-sided nerve; these end in acute, spinous points on each side, and as the breadth contracts most towards the apex, these sharp points are there more numerous; the apex is præmorse, or variously ragged, with the same points; the upper surface smooth, of a shining deep green; the under side is clothed with much ash-coloured, mealy matter, which is firmly attached to the substance of the leaflets; the length from three to five feet, the greatest breadth from four to five inches. *Stipes* with broad, stem-clasping bases, fringed with a very large portion of strong black fibres, like coarse black horse hair, intermixed with firm twigs, not unlike long, slender porcupine's quills; these serve to make their adhesion to the trunk more firm. Above they become three-sided, tapering, pretty smooth, except for a portion of mealy matter with which they are covered, till it is removed by friction. Length below the leaflets from four to six feet. leaflet-bearing portion from twelve to twenty feet. *Spathe* of many short imbricated leaflets, entirely covering the base or undivided part of the spadix. *Spadix* pendulous, branchy, from above six to ten feet long. In general they issue singly from the middle of the base of the stipes. *Branches* numerous, and simple, all perfectly pendulous. MALE FLOWERS numerous, occupying the lower spadices, without any mixture of female ones, and then in pairs, they are large, and the anthers loaded with pollen; sometimes they are mixed with the female flowers, in which case they are small, with less fertile anthers, and placed one on each side of a female flower. *Calyx* three-leaved; *leaflets* roundish, fleshy, concave, with their margins thin and imbricated. *Corol* of the large or proper male flowers, three-petalled. *Petals* sub-linear, smooth, expanding, of a firm leathery substance, concave and yellow on the inside, and of a deep purple on the outside; *margins* thick and meeting only. *Stamens* numerous, the length of the petals. *Filaments* short, inserted into a fleshy receptacle in the centre of the flower. *Anthers* linear. FEMALE FLOWERS sometimes in the same spadix, with the male, and then just half as numerous as the male, but in general they occupy separate spadices above those of the perfect male, or have the less perfect male flowers which accompany them, very small, probably abortive. *Calyx* five-leaved, *leaflets* short, unequal, imbricated, scarcely a third of the length of the corol. *Corol* three-petalled, the petals cordate, and much shorter than in the male. *Stamens*, rather *nectarial filaments*, sometimes there are three, very small round the base of the germ, as in *Caryota urens*, sometimes they are entirely wanting. *Germ* superior, three-lobed, smooth. *Style* none. *Stigmas* three, conical and three-sided. *Berry* as large as a crab apple, three-lobed, three-celled, smooth, fleshy, when ripe yellow, pulp very acrid. *Seeds* one in each cell, oblong, somewhat three-sided, affixed by the lower pointed end to a central receptacle, covered with a hard, black, tolerably smooth, thin shell. The *embryo* of the future plant is lodged about the mindle of the interior convex of the perisperm. III. 627 III. 628

The tree is nearly allied to *Caryota.* The chief difference is in the pericarpium, which is in this a three-seeded berry, in that one or two-seeded only. With respect to the various and important uses of this most elegant palm I have nothing to offer myself, but refer to what Rumphius and Marsden have written on the subject. At the same time, I cannot avoid recommending to every one who possesses lands, particularly such as are low, and near the coasts of India, to extend the cultivation thereof as much as possible. The palm wine itself and the sugar it yields, the black fibres for cables and cordage, and the pith for sago, independent of many other uses, are objects of very great importance, particularly to the first maritime power in the world, which is in a great measure dependant on foreign states for hemp, the chief material of which cordage is made in Europe. III. 629

Page Carey Ed. From observation made in the Botanic garden, well grown, thriving trees produce about six leaves annually, and each leaf yields from eight to sixteen ounces of the clean fibres.

Note. In the same garden are now (1810) many thousand plants, and young trees, some of them above twenty years growth, with trunks as thick as a stout man's body, and from twenty to thirty feet high, exclusive of the foliage. They are in blossom all the year; one of them was lately cut down, and yielded about 150 pounds of good Sago meal.

ALEURITES. Schreb. gen. N. 1472.

Male calyx one-leaved, two or three-cleft. *Corol* five-petalled. *Female calyx* and *corol* as in the male. *Germ* single, two-celled, with one ovulum in each, suspended from the top of the partition. *Styles* two, each two-cleft. *Drupe*, with two very hard, one-celled nuts. *Embryo* converse and furnished with a perisperm.

A. *triloba. Forst. gen. N.* 56. *Willd.* iv. 590.

Camirium. *Rumph. Amb.* ii. *p.* 180. *t.* 58.

C. *cordifolium. Gært. Sem.* ii. *t.* 125.

Juglans *Camirium. Lourier. Cochin Ch.* 702.

Croton *moluccanum. Willd.* iv. 551.

Beng. Akroot, which is also the name of the common Walnut.

A large tree, now pretty common in gardens about Calcutta, originally from the Malay
III. countries. Flowering time the hot season; seed ripe in August.
630 *Trunk* erect. *Branches* numerous, drooping, spreading and ascending. *Bark* smooth, olive-coloured; *young shoots* covered with much brownish stellate pubescence. *Leaves* about the extremities of the branches, approximate, petioled, cordate; margins frequently scollop-toothed, or even three or five-lobed; when young both sides covered with the same stellate pubescence that is found in the young shoots, but whiter, when full-grown pretty smooth, from four to eight inches long, and from three to six broad. *Petioles* round, as long as the leaves; two hemispheric glands at the apex as in several of the *Crotons*. *Stipules* none. *Panicles* terminal, erect, oval, clothed, as are all the other young parts with harsh, hairy, stellate pubescence; *flowers* numerous, small, white; *branches* caducous. MALE FLOWERS terminal, small, and most numerous. *Calyx* one-leaved, generally two-cleft; divisions erect, sometimes a little sub-divided, falling. *Petals* five, oblong, tapering towards the base. *Nectary* five small yellow glands between the insertion of the petals. *Filaments* about twenty, inserted into a hemispheric receptacle, short, thick, woolly. *Anthers*, two pits on the inside of the apex of each filament. FEMALE FLOWERS sessile, in the divisions of the panicle. *Calyx, corol* and *nectary* as in the male. *Germ* superior, single, oval, compressed, covered with stellate hairs, two-celled, each cell containing a single ovulum pendulous from the top of the partition. *Styles* two, each two-cleft to its base. *Stigma* incurved, acute. *Drupe* two-celled, fleshy, roundish, a little compressed, pretty smooth, somewhat pointed, slightly marked on the sides with four sutures, when ripe olive-coloured; the greatest diameter about two inches and half; *cells* lined with a firm, smooth, brown integument; it frequently happens that there is only one nut in the drupe, the form and size is then different. *Nuts* two, one in each cell, thick, and very hard, dark coloured, irregularly furrowed, particularly on the exterior side
III. covered with a firm, fleshy substance; which is white on the outside and marked with green
631 veins within, next to the nut, of a yellowish colour. *Nucleus* conform to the cavity of the nut. *Perisperm* amygdaline. *Embryo*, &c. as in Gærtner.

The kernels taste very much like fresh Walnuts, and are reckoned wholesome; they yield by expression a large portion of very pure, palatable oil.

JUGLANS. Schreb. gen. N. 1446.

Male calyx a one-leaved scale. *Corol* none. *Stigmas* eighteen. *Female calyx* four-cleft, superior. *Corol* none. *Styles* two. *Germ* semi-superior, one-celled, one-seeded; *attachment* inferior. *Nut* semi-quadrilocular, two-valved, one-seeded. *Embryo* inverse, with little or no perisperm.

1. J. *regia. Willd.* iv. 455.

Leaflets about nine, ovate-oblong, sub-serrate, nearly equal. *Fruit* globular.

Beng. Akroot.

Arab. Jown, or Shejir Jown.

Sans. Ukshadu, also Kundurala.

A native of the mountainous countries immediately to the north and north-east of Hindoostan, on the plains of Bengal, it grows pretty well, but is not fruitful there.

2. J. *plerococca. Roxb.*

Leaflets from three to thirteen, lanceolate, smooth. *Panicles* axillary and terminal. *Nuts* unequally but amply winged.

Bolus, the vernacular name in Silhet, where it is indigenous in the vast forests, which cover the hills to the north and east of that province; and grows to be a tree of considerable magnitude. The wood is of a light colour, and used by Turners. The bark thick, dark brown, possessing much tannin, and is reckoned by the natives, the best they are acquainted with for
III. tanning. Flowering time May.
632 *Branchlets* scabrous, with little elevated, white specks. *Young shoots* clothed with minute, gold-coloured scales. *Leaves* alternate, sub-opposite, and abruptly pinnate, from six to twelve inches long. *Leaflets* from three to four, or from five to thirteen, short-petioled, obliquely

lanceolate, obtusely acuminate, entire, firm and smooth, from three to six inches long, by one or two broad. *Petioles* round, when they first unfold, scaly like the other tender parts. *Panicles* axillary and terminal, shorter than the leaves; composed of many, filiform, simple male aments, and a few similar female ones, all are clothed with the minute yellow scales above mentioned. MALE FLOWERS. *Scales* of the ament solitary, one-flowered, scarcely to be distinguished from the pedicels, and clothed with the yellow scales just mentioned. *Calyx* four-leaved; *leaflets* roundish, concave, and so much separated as to appear in some measure four corollets. *Corol* none. *Filaments* twelve, very short, inserted on the base of the leaflets of the calyx. *Anthers* large, two-lobed. FEMALE FLOWERS. *Scales* of the ament, and calyx as in the male, only larger and more distinct, both are permanent; the former increasing. *Germ* inferior, turbinate, covered with little yellow scales, one-celled, containing a single ovulum, attached to the bottom of the cell. *Style* scarcely any. *Stigma* spread over the top of the germ, somewhat two-lobed, with the lobes rather lacerated. *Nut* round, very hairy, the size of a large pea, crowned with the permanent calyx, and resting in the enlarged scale of the ament, the three lobes of which are now increased into three long, lanceolate obtuse, scariose wings, the middle one of which, as in the germ, much larger, sometimes the inner margin of the scale is extended in the ripe state, into a two-lobed, short, broad wing, one-celled at top, which cell becomes four-lobed at bottom, (semi-quadrilocular,) two-valved; *valves* very hard. *Seeds* solitary, four-lobed. *Integument* single, thin, of a light brown. *Perisperm* conform to the seed, scanty, sebaceous. *Embryo* inverse. *Cotyledons* two, intricately folded up in the four lobes of the cell of the nut; when vegetation has advanced so far as to raise them above ground, they are deeply divided, nearly to the base, into two bifid segments. *Plumula* two-lobed. *Radicle* superior.

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QUERCUS. Schreb. gen. N. 1447.

Male calyx generally five-cleft. *Corol* none. *Stamina* from five to ten, or more. *Female calyx* entire, rugged. *Corol* none. *Styles* from two to five. *Nut* more or less embraced by the permanent calyx. *Embryo* inverse, without perisperm.

1. Q. *fenestrata. R.*

Leaves petioled, lanceolar, entire, finely acuminate, firm and polished. *Spikes* panicled, terminal. *Flowers* tern; *male* dodecandrous. *Nut* hemispherical, all but the obtuse apex hid in the oblately spherical, muricated cup.

A large tree, yielding wood of a good quality, a native of the mountains in the vicinity of Silhet, where it is called *Kala chukma* by the natives. Flowering time October and November; the seed takes nearly one year to ripen.

Young shoots, and indeed all the other tender parts particularly smooth. *Leaves* alternate, petioled, narrow-lanceolar, entire, finely acuminate, firm and polished; from six to eight inches long, by one and a half broad. *Spikes* terminal, becoming lateral by the growth of the branchlets, very numerous, forming many crowded panicles about the ends of the twigs, by far the greatest number male, and more slender than the female ones, all are erect, or nearly so; *flowers* tern, *male* dodecandrous. *Involucre* composed of many small, acute scales. *Germ* inferior, three-celled, with two ovula in each attached to the top of their cell. *Style* three-cleft. *Nuts* sub-globular, smooth, of a chesnut-colour, all except a small circular portion of the vertex completely covered by the spherical, slightly echinated, thin cup, as if peeping out at a small circular window. Hence the specific name.

III. 634

2. Q. *lanceæfolia. Roxb.*

Leaves short-petioled, lanceolar, entire, obtusely acuminate, firm and lucid. *Spikes* panicled, terminal. *Nuts* oval; cup in some completely covering the nut, in others variously split and covering more or less of its lower part only.

Shingra, the vernacular name in the Garrow country, where it grows to be a very large and useful timber tree; the wood light-coloured like the English oak, but harder, and reckoned one of their most durable timbers. Flowering time December; the seeds ripen in October.

Young shoots somewhat angular and perfectly smooth. *Leaves* alternate, short-petioled, lanceolar, tapering equally at each end, entire, acuminate, smooth, glossy, and hard; from five to six inches long by one and a half broad. *Stipules* ensiform, dropping before the leaves are expanded. *Buds* round, smooth, chesnut-coloured, and early formed in the axills of the leaves. *Panicles* axillary and terminal, composed of many, long, straight, simple spikes, with the rachis often ending in a scaly bud, which sometimes shoots into a branchlet. *Spikes* villous, the male ones most numerous, and below the female ones. *Male flowers* minute, generally solitary, though pretty much crowded. *Calyx* five or six parted. *Segments* ovate, and downy. *Corol* none. *Filaments* from six to twelve, twice the length of the calyx, inserted round a convex, woolly gland in the centre. *Anthers* roundish. *Female spikes* on the same panicle with the male, but fewer and uppermost. *Flowers* always distinct, and less crowded. *Nut* of a rather long oval shape, thin, a little hairy, brown, the size of the common acorn, or rather longer. *Cup* thin, attached to the rachis laterally, rather rough on the outside, somewhat villous, sometimes forming a complete envelope for the nut, suffering the stigma to pass at a small perforation in the apex; in others it splits into two or three portions, and then embraces more or less of the nut. *Seed* conform to the nut, generally single; when two, they are so closely united as to seem a single seed with a double cotyledon in the apex. *Integument* single, brown, adhering to the cotyledons, and entering deeply into them in various directions, in [illegible] manner, &c. *Perisperm* none. *Embryo* conform to the seed, inverse, as in the other species.

III. 635

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3. Q. *lucida. Roxb.*

Leaves cuneate lanceolar, entire, and smooth. *Spikes* panicled; *male flowers* dodecandrous. *Acorns* round, nearly hid in the enlarged cup, which is marked with concentric belts on the outside.

A tree, a native of Pulo Pinang.

Leaves alternate, short-petioled, somewhat wedge-shaped, obtuse-pointed, entire and smooth in every part; about six inches long, and about two broad. *Stipules* small, subulate. *Spikes* terminal, very numerous, filiform, by far the greatest part bear only male flowers. MALE FLOWERS crowded. *Calyx* about six-cleft. *Stamens* about twelve, and two or three times longer than the calyx. *Pistillum* a woolly gland occupies its place. FEMALE FLOWERS more remote, and on separate spikes. *Calyx* with three, small, scale-like bractes, pressing on the underside. *Styles* three. *Seed* roundish, sunk in the much enlarged, pitcher-shaped, fleshy calyx, which is now surrounded with several coloured belts.

4. Q. *muricata. Roxb.*

Tender parts villous. *Leaves* oblong, entire. *Female spikes* axillary, and lateral, the length of the leaves. *Acorn* spherical, two-thirds hid in a turbinate, muricated cup.

A large timber tree, found by Mr. W. Roxburgh indigenous in the forests of Prince of Wales' Island.

Young shoots round, and clothed with short, very soft, brown pubescence. *Leaves* subsessile, narrow, oblong, entire, rather acute, villous; *veins* simple, and parallel; from four to
III. six inches long, by one and a half broad. *Female spikes* lateral, about as long as the leaves.
636 *Cup* turbinate, armed with many concentric rings of small inoffensive, acute points; hence the specific name.

5. Q. *turbinata. R.*

Leaves lanceolar, entire, obtusely acuminate, hard, glossy. *Spikes* terminal, generally paired; the lower part occupied by clusters of female flowers, and the upper part crowded with male ones. *Nuts* turbinate, smooth; *cup* small, rugose.

Bansooa Batana, the vernacular name in Chittagong, where it grows to be large tree, but its wood is used for fuel only. It flowers in May; and the acorns ripen about the close of the rains.

Young shoots void of pubescence, but somewhat scabrous with small white specks. *Leaves* short-petioled, lanceolar, entire, obtusely acuminate, of a very hard texture, and glossy, from five to six inches long, by one and a half or two broad. *Spikes* terminal, rigid, simple, crowded with numerous, minute, male flowers on the exterior half; and female hermaphrodite ones in detached clusters over the lower half. *Male calyx* five-toothed, woolly. *Corol* none. *Filaments* from ten to fifteen, much longer than the calyx. *Anthers* oval. *Germ* none, but a conical gland in its place. FEMALE HERMAPHRODITE. *Involucre* large, downy, scaly. *Perianth* superior, small, downy, about six-toothed. *Filaments* about as many as in the male, shorter than the styles, intermixed with much white hair. *Anthers* small, probably quite abortive. *Germ* three-celled, with one ovulum in each attached to the top of the cell. *Style* short but thick, and giving support to the calyx and stamina. *Stigmas* three, cylindric, spreading a little. *Nut* turbinate, smooth, of the size of a chesnut, light brown; *cup* small, embracing only the narrow base of the nut, rugose. *Embryo* inverse, as in the genus.

6. Q. *acuminata. R.*

Leaves oblong and broad-lanceolar, entire, smooth. *Spikes* axillary, solitary, simple. *Nuts*
III. ovate, smooth. *Cup* saucer-shaped, prickly.
637 Kant*a* gol*a* Batan*a*, the vernacular name in Chittagong, where it grows to be a large and useful timber tree. It flowers in May, and the acorns ripen about the close of the rains.

Young shoots somewhat villous. *Leaves* short-petioled, broad-lanceolar, entire, acuminate, smooth on both sides, from six to twelve inches long, by three or four broad. *Female spikes* axillary, solitary, shorter than the leaves, villous, the upper three-fourths occupied with distinct female flowers. *Involucre* large, hoary, imbricated upward with acuminate scales. *Perianth* minute, five-toothed. *Germ* broad-ovate, three-celled, with one ovulum in each, attached to the top of the cell. *Style* short. *Stigma* three, cylindric. *Nut* ovate, smooth, brown, rather longer than the common acorn. *Cup* saucer-shaped, echinate, with short projecting sharp prickles, embracing about one-fourth part of the nut only. *Embryo* inverse, as in the genus.

7. Q. *lappacea. Roxb.*

Leaves lanceolar, entire, much acuminated, downy underneath. *Spikes* axillary, solitary. *Nut* ovate, villous, slightly embraced by the inoffensive, echinate, saucer-shaped cup.

Ooloo chukma, the vernacular name in Silhet. On the hills which bound the north side of the province, it grows to be a large tree, and furnishes the natives with strong wood in colour like that of the common oak, but of a harder texture and close-grained. Flowering time December; the seeds ripen in the September following.

Young shoots densely clothed with very soft down. *Leaves* alternate, short-petioled, lanceolar, entire, much acuminated, nearly smooth above, tomentose underneath, from six to eight inches long, by about two broad. *Stipules* very downy, and falling early. *Spikes*, or *aments*, axillary, solitary, nearly as long as the leaves, slender, very downy, some entirely and
III. densely covered with small yellowish, downy, male flowers, others equally crowded with male
638 ones, at the apex and a few remote at the base, the rest or middle part, occupied by the female flowers only. *Bractes* solitary, under each flower, small, downy. MALE FLOWERS. *Calyx* five-parted, downy. *Corol* none. *Filaments* generally ten, inserted round a woolly gland, two or three times longer than the calyx. *Anthers* two-lobed. FEMALE FLOWERS. *Involucre* arm-

ed with numerous, incurved, soft, hairy, pretty long, echinate spines, which increase in size with this organ, and give to the cup a fierce appearance, though soft and innocuous; they may be compared to the common bur;—hence my specific name. *Calyx* hoary; *mouth* four, five or six-toothed. *Style* short. *Stigma* three, cylindric. *Nut* ovate, of the size of a large filbert, villous, crowned with the permanent calyx and style. *Cup* saucer-shaped, echinate, rather soft, hairy. *Seed* conform to the nut, as in Q. *robur, Gært. Sem.* i. 183. *t.* 37. Page Carey Ed.

8. Q. *squamata. Roxb.*

Leaves broad-lanceolar, entire, somewhat acuminate, coriaceous and glossy. *Spikes* axillary and terminal, often compound, the terminal ones panicled. *Cups* growing together, massy, rough and scaly, embracing slightly the base of the hemispherical, hard, glossy nut.

Bura chukma, is the vernacular name in Silhet. A large timber tree, a native of the Garrow mountains, where it blossoms in February and ripens its seed in September and October. The wood is lighter coloured than that of the English oak, but seems equally strong, and is fully as close in the grain.

Young shoots perfectly smooth. *Leaves* alternate, short-petioled, from oblong to lanceolar, tapering most toward the base, obtusely acuminate, entire, smooth, having the upper surface glossy, particularly hard and firm, from six to seven inches long, by about three broad. *Petioles* smooth, flat on the upper side, about half or three-fourths of an inch long. *Spikes* numerous, both axillary and terminal, the whole forming a large panicle which is often larger than the leaves, and very hoary; in or near the centre, one or more of the spikes more robust, and shorter; such, so far as I have observed, bear female flowers only, they are in more remote fascicles of three each; the small spikes are longer, and have the little bundles of flowers longer, and much nearer to each other. *Bractes* broad-ensiform, under each of the little bundles of flowers. *Male calyx* of about six, unequal, very woolly scales. *Filaments* twelve, three times longer than the calyx, smooth. *Anthers* oval. *Germ*, in the centre of the insertion of the filaments is a very woolly gland. *Female calyx* as in the genus, and like the male one very woolly. *Nut* in shape not far removed from hemispheric, being nearly truncated at the base, and there rather above an inch in diameter, polished, dark brown, very hard, one-celled. *Cup* saucer-shaped, hard, having its surface imbricated with small pointed scales. *Seed* solitary, conform to the nut, as in the genus. III. 639

9. Q. *ferox. Roxb.*

Leaves ovate-lanceolate, and oblong-acute, entire, glossy. *Male spikes* pointed; *flowers* with a six-cleft calyx, and twelve stamina. *Cup* an entire evalvular capsule, armed with many compound thorns, hiding completely the sub-ovate acorn.

A large timber tree, a native of the Chittagong mountains. Flowering time the beginning of the hot season; the seed ripens in July and August.

Young shoots void of pubescence, but marked with lighter coloured specks. *Leaves* alternate, petioled, oblong and broad-lanceolar, acuminate, entire, firm and glossy; from three to six inches long, by from one to three broad. *Spikes* terminal, panicled, long and slender; the *male* ones many, the *female* ones few. *Male flowers* minute, collected into small globular, approximate bundles over the long filiform spikes. *Calyx* six-cleft, villous. *Filaments* twelve, twice the length of the calyx. *Anthers* oval. *Nut* sub-ovate, of the size of a filbert, smooth, completely covered by the entire, evalvular capsule-like cup, or involucre which is powerfully armed all over the whole of the outside, with strong, sharp, compound spines; and lined with a little sericeous pubescence. III. 640

10. Q. *armata. R.*

Leaves lanceolate, acuminate, entire, smooth. *Cup* an entire, evalvular capsule, armed with many compound thorns, hiding completely the sub-ovate acorn.

A large timber tree, a native of the mountainous countries immediately east of Bengal. At Chittagong, it is called *Kanta-lal batana;* at Tippera *Singhara*; and in the forests near Gwalpara, *Kanta Singur.*

11. Q. *castanicarpa. R.*

Leaves oblong, entire, smooth. *Nuts* ovate, a little hairy, completely hid in the evalvular, capsule-like cup, which is completely armed with numerous, ramous, sharp spines.

Lumba kanta hurina batana is the vernacular name at Chittagong, where it grows to be a large tree, with many far-extended branches. It flowers in July and August, and the acorns, which are small, ripen in the cool season. The leaves in this are very large, generally about a foot long, and from four to five inches broad.

12. Q. *glomerata. R.*

Leaves elliptic, entire, polished on both sides. *Female flowers* on long, terminal, glomerate spikes. *Acorn* ovate, smooth, half hid in the tubercled cup.

A large tree, found in the forests of Pulo Pinang by Mr. W. Roxburgh; male flowers not seen.

13. Q *depressa. Roxb.*

Acorns depressed, with the remains of the large style in the middle of the concavity. *Cup* flat, with a thick, callous margin, and five, concentric, imbricated lamella underneath.

An immense tree, a native of the forests of Pulo Pinang. It differs from Loureiro's Q. *concentrica*, in the depressed shape of the acorn and cup. III. 641

14. Q. *lamellata. R.*

Acorns much flattened, but convex at both ends, and hidden in the round cup, which is imbricated with ten or twelve, concentric lamella.

A native of the forests of Pulo Pinang.

15. Q. *semiserrata. R.*

Page Carey Ed. *Leaves* petioled, lanceolar, firm and lucid, anterior margins serrate; *veins* simple and parallel. *Female flowers* in axillary pairs. *Nuts* oval, acuminate, smooth, of a chesnut colour, base only embraced by the saucer-shaped, thick, belted, villous cup.

A large timber tree, a native of the mountains in the vicinity of Silhet, where it is called Ramkatha; there it flowers about the beginning of the hot season, and the seed ripens in August.

Bark of the young shoots smooth, lucid green, except when just unfolding, thin, clothed with a soft, ferruginous, woolly substance. *Leaves* scattered about the ends of the twigs, petioled, lanceolar, with the anterior margin remotely and acutely serrate, the apex acute, the texture hard, and polished, and the *veins* simple and parallel, from four to eight inches long, by one to three broad. *Petioles* about an inch long, smooth. *Female flowers* axillary, paired and sessile. *Involucre* composed of from five to six, concentric, incurved, villous lamina. *Nuts* oval, pointed, smooth, of a chesnut colour, the size of a large olive; a small portion of the base only is embraced by the thick, hard, villous, saucer-shaped cup. *Embryo* inverse, without perisperm, as in the genus.

16. Q. *serrata. Willd.* iv. 431.

Young shoots densely clothed with ferruginous down. *Leaves* oblong, lucid, hoary underneath, parallel-veined, most acutely gross-serrate. *Spikes* terminal, male and female mixed.

III. 642 Gol-Shingra the vernacular name in the Silhet district between Silhet and the river Brahmunputra, where it grows to be a large, and like the most of the other species, natives of that mountainous tract, a useful timber tree. Flowering time the end of the rains.

In this species the young shoots are very completely clothed with much soft, dark brown down. The leaves very hard, with very numerous, simple, and parallel veins, each terminating in a sharp serrature like those of *Dillenia speciosa;* some few are now and then sharply laciniate, even lobate.

Spikes terminal, sub-panicled, consisting of only a few distinct male and female, downy aments. *Male flowers* with a five-leaved calyx, and from ten to twelve stamina; *female* ones as in the other species. The acorn I have not yet seen.

17. Q. *incana. Roxb.*

Leaves cordate-oblong, firm, remotely and acutely serrate, smooth above, hoary underneath. *Male aments* panicled, shorter than the leaves; *flowers* pentandrous. *Acorns* ovate-oblong, half hid in a sub-rotund, scaly, tubercled cup.

A large timber tree, a native of the mountains of Kamaoon, Almora, and other countries north of the plains of Hindoosthan. A short account of the tree is given by Col. Hardwicke in his Journey to Shreenagur. *Asiat. Res.* vi. 374.

Young shoots hoary. *Leaves* alternate, short-petioled, oblong, with a cordate base, acute, remotely and acutely serrate, of a rigid texture, smooth above, hoary underneath, from three to six inches long, and from one to two broad. *Stipules* and *bractes* linear-lanceolate, membranaceous, caducous. *Male aments* filiform, numerous, forming small, terminal, or axillary panicles. *Calyx* from four to five-cleft, and ciliate. *Stamens* from four to eight. *Female peduncles* axillary, lateral or terminal, very short, from one to many-flowered, three seems the most common number. *Stigma* three-cleft. *Nut* ovate-oblong, smooth, with a villous apex, crowned with part of the remaining style. *Cup* roundish, imbricated with small tubercled scales.

III. 643

CASTANEA. Schreb. gen. N. 1448.

Male calyx none. *Corol* five-petalled. *Stamina* from ten to twenty. *Female calyx* from five to six-leaved, muricate. *Corol* none. *Germ* inferior, three-celled; *cells* one-seeded; *attachment* inferior. *Stigmas* penciliform. *Nuts* from one to three, inclosed in the echinate involucre. *Embryo* inverse, without perisperm.

1. C. *Indica. Roxb.*

Leaves oblong, acute, mucronate-serrate, polished above, hoary underneath. *Aments* subterminal, panicled. *Flowers* polygamous.

Nikari, the vernacular name in Silhet.

A small tree, a native of the hilly frontier districts east of Bengal. It flowers during the months of November and December, and the seed ripens in from eight to ten months afterwards. The kernels are eaten by both natives and Europeans, and may be compared to indifferent filberts.

Trunk tolerably straight, growing to such a size as to admit of the wood, which is of a good quality, being used for various purposes. *Branchlets* downy. *Leaves* alternate, short-petioled, from oblong to broad lanceolate, acute, grossly mucronate-serrate, polished on the upper surface, soft with brownish down underneath; *veins* simple, parallel, and equal in number with the serratures, each ending in the sharp points thereof, from four to eight inches long, by from two to four broad. *Stipules* ensiform. *Aments* or spikes, terminal and axillary, panicled, alternate, filiform, downy, those with male flowers more numerous, those with hermaphrodite few and thicker, of an offensive smell. MALE FLOWERS collected in small bundles over the spikes. *Calyx* generally six-leaved; *leaflets* oval, very woolly. *Filaments* twelve, longer than the calyx. *Anthers* round-oval. *Hermaphrodite flowers* generally solitary, and

III. 644 scattered over every part of their spikes, rarely any male flowers with them. Sometimes two or even three come together, and are then surrounded by the same scaly calycle, or involucre to be mentioned under the next article. *Calyx* superior, its parts as in the male, with the base closely embraced on all sides by numerous hairy scales. The most exterior of which are broad;

the inner ones are subulate points which become the capsule or spinous envelope of the seed. *Filaments* twelve, alternately shorter, the long ones six, about the length of the calyx. *Anthers* oval, two-lobed. *Germ* inferior, three-lobed, three-celled, with one ovulum in each, attached to the bottom of its cell. *Styles* three, a little recurved. *Stigma* simple, obtuse. *Fruit* from round to obovate, completely armed with ramous spines, as in C. *vesca*, one-celled, not opening by regular valves, but bursting without order when the seed is ripe. When two or more hermaphrodite flowers are found crowded so close as to press on each other, those when come to maturity, have only one common capsule, or envelope. *Nuts* oval, of a pretty hard, ligneous texture, and light brown colour, somewhat hairy, particularly round the apex. Inside soft and hairy, one-celled, evalvular. *Seed* generally single, conform to the nut. *Integument* single, thin, striated, and hairy. *Perisperm* none. *Embryo* the size and figure of the seed, inverse. *Plumula* two-lobed. *Radicle* oval, superior. Page Carey Ed.

2. C. *pumila. Willd.* iv. 461.

Leaves oblong, acute, mucronate, serrate, tomentose underneath.

Chin. Fing lot.

From Canton in China, it has been introduced into the Botanic garden at Calcutta, where its growth is uncommonly slow, and though it has been there many years, it shows no tendency to blossom.

SAGITTARIA. Schreb. gen. N. 1441.

Male calyx three-leaved. *Corol* three-petalled. *Stamina* from six to twenty-four. *Female (Hermaphrodite, R.) calyx* and *corol* as in the male. *Germ* and *seeds* numerous. *Embryo* conduplicate, without perisperm. III. 645

1. S. *sagittifolia. Willd.* iv. 408.

Leaves sagittate, acute; *lobes* narrow, straight and acute. *Scape* simple. *Flowers* tern.

A native of the borders of sweet water lakes, ditches, &c. in the vicinity of Calcutta, where it flowers in February, March, and April.

Root consisting of numerous, spongy fibres, from a crown, formed by the united leaves, the centre one thicker, and ending in the half putrid remains of the small round tuber, or bulb, which gave existence to the plant, while from its sides many suckers run a few inches, each ending in a small, round bulb, which in due time produce other plants. *Leaves* radical, the first of the young plants linear, uncommonly slender, and very acute, the next one or two simply cordate oblong, the rest with angular, spongy petioles of different lengths, and sagittate, acute, smooth, with the barbs or posterior lobes, from two to three-nerved, and rather longer than the single, five-nerved, narrower and much more acute, in fact, ensiform upper portion, about six inches long; *petioles* from six inches to two feet long. *Scapes* simple, as long as the leaves, columnar, spongy. *Flowers* pure white, pedicelled, uniformly tern, the inferior three, and sometimes the second, or a part thereof female, the rest male. *Bractes* tern, triangular, one-flowered, shorter than the pedicels. *Calyx* and *Corol* as in S. *sagittifolia* of Europe, only the latter is pure white throughout. *Filaments* in the male flowers, about twenty-five, shorter than the ovate-oblong, yellow anthers. In the female none, but some few, abortive germs are found in the disk of the former. *Germ* in the female flowers very numerous, &c. as in S. *sagittifolia, Gært. Sem.* ii. 21. *t.* 84, but the *embryo* in our Indian plant is of a pale greenish yellow colour. III. 646

Dr. Smith observes, in his description of S. *sagittifolia*, that it discharges a white milky juice, a rare circumstance in an aquatic plant. Our Bengal plant yields nothing of the kind; whether this is a sufficient ground for considering ours to be a distinct species, I will not presume to say, but must observe, that I cannot discover any other difference. I do not find that any use is made of the bulbs in Bengal.

2. S. *obtusifolia. Willd.* iv. 409.

Polygamous. *Leaves* reniform, sagittate-obtuse, lobes long, taper and acute. *Scape* ramous, and verticelled; *flowers* hexandrous.

Culi tamara. *Rheed. Mal.* xi. *t.* 45.

A native of standing sweet water, or slow running rivers. It flowers during the cold season.

Root fibrous, annual. *Leaves* radical, erect, long-petioled ovate-saggittate; *apex* circular, *lobes* or barbs divaricate, tapering to long, narrow, fine points, smooth, many-nerved: from six to twelve inches long, and from four to eight broad. *Petioles* from two to three feet long, thick, one side flat, the other angular. *Scapes* including the flower-bearing part from two to four feet high, erect, from five to six-angled, striated, the lower verticel, and sometimes the second, bear branches mixed with one-flowered pedicels. *Involucre* at each verticel three-fold, sessile, conical. *Flowers* numerous, small, white. *Male flowers* for the most part terminal, pedunculed; *peduncles* slender. *Calyx* three-leaved. *Corol* three-petalled. *Filaments* six, below they are enlarged, so as to occupy the whole of the centre of the flowers. *Anthers* two-lobed. *Hermaphrodite flowers*, for there are no male flwowers, at least I have never found any, more numerous below, robust, peduncled. *Calyx* and *corol* as in the male. *Filaments* six, with their enlarged bases surrounding the germs. *Germs* about thirty, sessile. *Stigma* two-lobed, bearded, or downy. *Drupes* numerous, collected on a globular receptacle, turbinate, dry, wrinkled. *Nut* one-seeded, but there are also two empty cavities, one in each side of the seed. *Seed* bent double, with the two extremities pointing to the base, by one of which it is affixed to the bottom of the drupe. III. 647

3. S. *cordifolia. Roxb.*

Polygamous. *Leaves* cordate; *scapes* simple. *Stamina* from six to twelve.

Page Carey Ed.

Grows in standing sweet water, in the vicinity of Calcutta; flowering time the latter part of the rains.

Root fibrous, annual. *Leaves* radical, long-petioled, round cordate, apex circular; behind deeply divided into two broad, somewhat pointed lobes, margins entire, smooth on both sides, many-nerved, about two inches broad, and less than three long. *Petioles* sheathing at the base, their length depends much on the depth of the water; tapering, somewhat angular, smooth. *Scapes* about as long as the petioles, like them ending in an oblong raceme, of from five to eight flowers. *Bractes*, or *involucres*, three-fold, to the lower three there are always two hermaphrodite flowers, and three to the rest, one of which is generally male. HERMAPHRODITE FLOWERS. *Calyx* and *corol* as in the genus. *Filaments* generally from nine to twelve inserted round the base of the germs. *Anthers* cordate. *Germs* numerous, compressed. *Style* short. *Stigma* simple. *Capsules* from three to four hundred, much compressed on a globular naked receptacle, surrounded with a deeply dentated margin, in each a single seed, bent double, as in S. *obtusifolia*. MALE FLOWERS. *Calyx* and *corol* as above. *Stamens* from six to ten, surrounding a few abortive germs.

BEGONIA. Schreb. gen. N. 1442.

III. 648

Male calyx none. *Corol* four-petalled, two opposite, larger. *Stamina* numerous. *Female calyx* none. *Corol* four, or many-petalled. *Capsules* inferior, winged, or lobed, three-celled, many-seeded.

1. B. *malabarica. Dryand. in Trans. of Linn. Soc.* i. *p.* 171.

Caulescent, herbaceous. *Leaves* unequally cordate, while young acutely serrulate-dentate; *peduncles* axillary, many-flowered; *capsule* without wings, four-lobed, four-celled.

Tsjeria narenampuli. *Rheed. Mal.* ix. *t.* 86.

Ram totee, the vernacular name at Chittagong, where it is indigenous, in moist cool vallies. Plants from thence have been received into the Botanic garden at Calcutta, where they continue in flower the whole year, but chiefly in the rains. The natives of Chittagong, where the plant is plenty, use the leaves as a pot-herb; when fresh the taste is pleasantly acid, not unlike sorrel.

Root perennial, succulent, throughout a pretty deep red. *Stems* herbaceous, several from the same root, sub-erect, from six to twelve inches high, succulent, round, jointed, and rather swelled at the joints, marked with numerous, small lanceolar ferruginous, rather elevated specks, while young hairy. *Leaves* alternate, petioled, unequally or rather sub-semi-cordate, acuminate, harsh, with a few short, stiff hairs, with the margins, particularly while young, acutely and unequally serrulate-dentate, and minutely curled, from six to eight inches long, by four or five broad. *Petioles* rather shorter than the leaves, round, hairy and marked with ferruginous specks like the stems. *Stipules* oblong, stem-clasping. *Peduncles* axillary, short, bifid, many-flowered. *Flowers* pretty large, particularly the female ones, drooping, of a very pale pink, indeed almost white, sparkling, as if frosted; sweetly fragrant. *Bractes* round the base of the pedicels, minute. *Male calyx* none. *Petals* four, in opposite pairs, sub-rotund, the

III. 649

inner pair rather smaller by the size of a thin margin, which in the large pair, forms a sharp, vertical rim round the unexpanded globular flower bud. *Filaments* from sixty to eighty, very short. *Anthers* long, clavate, opening with a long slit on opposite sides. *Female calyx* none. *Corol* as in the male, but larger. *Stamina* none. *Germ* inferior, smooth, and thickly spotted with red, four-lobed, four-celled; each cell containing two reniform receptacles, attached to the middle of the axis, ovula innumerable over every part of the receptacles. *Style* four, bifid, yellow; *segments* or *stigma* spiral like the horns of a ram.

2. B. *laciniata. R.*

Caulescent, erect, hairy. *Leaves* unequally cordate, laciniate, serrulate-dentate. *Peduncles* the length of the petioles, few-flowered. *Capsule* with one large, oval, obtuse wing.

Beng. Hooirjo.

A native of the Garrow hills, and the eastern frontier of Bengal. Flowering time the rainy season, the seeds ripen in November.

Root fibrous. *Stem* simple, rather succulent, about biennial, first erect, afterwards more or less procumbent, hairy, jointed; from six to eighteen inches long, and as thick as a ratan. *Leaves* alternate, long-petioled, unequally cordate, acutely laciniate, margins serrulate-dentate, and ciliate; from three to six inches long and broad. *Stipules* oblong. *Peduncles* axillary, solitary, about as long as the leaves, from two to six-flowered, and generally more than half of them male. *Bractes* like the stipules, but smaller. *Corol* four-petalled, cruciate-oval within, ferruginous on the back. *Male stamina* numerous, inserted on a conical receptacle, clavate. *Filaments* rather short. *Female germ* inferior, oval, with two narrow and one broader wing, and for the most part only two-celled, each containing numerous ovula, attached to two jugiform receptacles in each cell, rising from the axis, as in Gærtner's *Mussaenda frondosa*. *Style*

III. 650

scarcely any. *Stigma* large, variously convolute. *Capsule* oblong, three-winged; but two of them so narrow as scarcely to be observed if not carefully looked for, the third broad oval, and obtuse, three-celled, as in the germ.

3. B. *aptera. R.*

Shrubby, sub-parasitic. *Leaves* semi-cordate, entire, smooth. *Capsules* wingless.

Found by Colonel Hardwicke on the Island of Mauritius. He says it is a large spreading shrub.

Stem rather slender, and mostly growing out of decaying, or rotten trunks of fallen trees, in wet shaded woods. *Peduncles* axillary, solitary, bifid, each division three-flowered; the

middle one larger, sessile, and male; the other two short-pedicelled, and female. *Calyx* none. *Corol, stamina,* &c. as in the genus; only the *capsules* are destitute of wings. Page Carey Ed.

MONOECIA MONADELPHIA.

NIPA. Schreb. gen. N. 1696.

Male spathe; corol six-petalled. *Anthers* six pair round the apex of a single filament. *Female spathe; corol* none. *Fruit* compound. *Nuts* or *drupes* angular, one-seeded.

N. fruticans. Willd. iv. 597. *Thunb. Act.* 1782. *p.* 231.

Nypa. *Rumph. Amb.* i. *t.* 16.

Beng. Goolga Gucina, or Gubna.

Cocos *nypa. Lourier. Cochin Ch.* 694.

Grows on the lower parts of the Delta of the Ganges, and in salt swamps.

PINUS. Schreb. gen. N. 1456.

Male flowers in clusters. *Calyx* of several scales, or of four leaves, *(Linn.) Corol* none. *Stamina* many. *Female calyx,* scales of the strobiles two-flowered. *Corol* none. *Pistil* one. *Seed* membrane-winged. III.

1. P. *longifolia. Willd.* iv. 500. 651

Leaves three-fold, filiform, from twelve to eighteen inches long, pendulous, with the margins a little scabrous. *Cones* ovate, shorter than the leaves, scales with thick recurved apices. *Anthers* crowned.

Hind. Chur the name of the tree, and Surul the wood.

In gardens about Calcutta a few small trees of this species are found, all from Nepal or from the mountains north of the plains of Bengal, and Oude, or reared from seed from thence, where they are found on the stupendous mountains, growing to an immense size. There they blossom about the beginning of the hot season.

Trunk, I have observed above, that the trees about Calcutta are small, but in Nepal, I am informed they grow straight to upwards of an hundred feet in height; the bark is scabrous. The *branches* verticelled, and rather few in number than otherwise, so that here the head is thin, of a roundish form, and yields little shade—I mean the trees about Calcutta. *Leaves* three-fold, disposed in approximated spiral rows round the end of the branchlets, perfectly filiform; margins somewhat hispid, when the finger is drawn backward, generally pendulous, and from nine to eighteen inches or more in length. *Stipules* or *sheaths,* round the base of the leaves, numerous and chaffy. MALE FLOWERS. *Antheral racemes* numerous at the extremities of the branchlets, from their centre issue the shoots of the same season. *Bractes* solitary, one to each raceme. *Flowers* very numerous. *Filaments* scarcely any. *Anthers* clavate, opening on each side, and crowned with a large roundish scale, inflexed over the next above.

2. P. *Devdara R.*

Branches drooping. *Leaves* in approximated fascicles of about forty, rigid, acute. *Strobilus* erect, oval; *scales* thereof appressed, thin, smooth, even-edged, transversely elliptic. *Cotyledons* ten. III.

Devadaroo, or Devdar, is the name the tree is known by amongst the natives where it grows. 652

A tree of great size, a native of the mountains north of Rohilcund. It differs from P. *Larix* in many respects, but most conspicuously in being destitute of the bractes which project beyond the scales of the strobile or cone.

Leaves in approximate clusters of about forty, straight, three-sided, rigid and acute. *Male aments* scattered between the fascicles of leaves, at first oval, but lengthening with age, imbricated with numerous bi-antheriferous scales with dilated incurved apices. *Filaments* no other than the just mentioned scales of the aments. *Anthers,* an oblong one-celled one, on each side of the narrow inferior part of the scales. *Strobile* or *cone* erect, peduncled, oval, obtuse, of the size of a pullet's egg. *Scales* thereof transversely elliptic, or broad reniform, concave with a thin, smooth, even edge, they remain from their broad concave structure, so close as in general to prevent the escape of the seeds without help.

The tree is so exceedingly replete with resin, as to yield a very large proportion of tar. A manufactory of that article was lately begun, near the skirts of the Almora mountains by Mr. Gott.

Extract of a letter from that Gentleman, (Mr. Gott,) dated Kosupoor, 2nd November 1804, describing the Devdar pine.

"The only account I can give you of the Devdar pine, is from a variety of enquiries I have at times made of the natives. It grows a very considerable distance within the hills, none less than six days' journey for a native. It does not appear to delight in a situation on the summit of mountains; on the contrary it grows in valleys, and most abundantly in plains, on the side of large, or tops of small hills that are but little exposed. Its height is described to exceed twenty feet, and its bulk in proportion, from four to five feet in diameter; it grows very straight, and as regularly tapering as a fishing rod, with branches down to the ground.

CUPRESSUS. Schreb. gen. N. 1458. III. 653

Male calyx, the scales of the ament. *Corol* none. *Anthers* four, sessile, without filaments.

Page Carey Ed.

Female calyx, the scales of the aments one-flowered. *Corol* none. *Styles* none. *Stigma*, concave dots. *Strobile* with angular nuts.

C. *sempervirens. Willd.* iv. 511.

Leaves imbricated; *twigs* quadrangular.

Chin. Yeum Fa.

Hind. Sarass.

The upright variety is a native of China, and of the northern mountains of India, and Persia. It does not thrive on the plains of Bengal.

THUJA. Schreb. gen. N. 1457.

Male calyx, the scales of the ament. *Corol* none. *Stamina* four. *Female calyx* the scales of the ament, two-flowered. *Corol* none. *Pistil* none. *Nut* one girt with a membranaceous wing.

T. *orientalis. Willd.* iv. 509.

Strobiles squarrose, with sharp scales. *Branchlets* ancipital.

Chin. Piem Fa.

From China it has been introduced into our garden in India, where it rarely grows to more than eight or ten feet in height, is very ramous, and spreads nearly as much as its height.

PHYLLANTHUS. Schreb. gen. N. 1412.

Male calyx from four to six-leaved, or from four to six-parted. *Corol* none. *Nectary*
III. from four to six scales. *Stamina* various. *Female calyx* and *nectary* as in the male. *Germ*
654 superior, generally three-celled; *cells* two-seeded, attached to the upper end of the axis. *Capsule** three-celled; *cells* two-seeded. *Embryo* inverse, and furnished with a perisperm.

SECT. I. *With simple Leaves.*

1. P. *madraspatensis. Willd.* iv. 575.

Annual, erect. *Leaves* alternate, narrow-cuneate. *Flowers* axillary; *male* monadelphous *anthers* three pair.

Teling. Nala userekee.

Is common, with P. *Niruri*, in gardens, and cultivated ground. Plants constantly succeed one another, and flower most part of the year.

Root annual, though sometimes it lives out the second year. *Stem* straight, in the oldest plants somewhat woody, from one to four feet high, round, smooth, above very ramous. *Branches* sub-erect, often twiggy in large plants. *Leaves* on the stem scattered; on the branches alternate, bifarious, spreading, sessile; in a good soil those on the stem are linearly lanceolate, the rest wedge-formed, smooth, entire, somewhat pointed, from half an inch to two inches long, and from one-eighth to half an inch broad. *Stipules* two, lateral at the cordate base, pointed, withering. *Flowers* axillary, always one female, and from two to four or five males, all are short-peduncled, but the male shortest, in the flowering time erect, afterwards the male drops, and the female is bent down. *Male calyx* six-leaved. *Nectary* six-scaled. *Filaments* single. *Anthers* three pair round its apex. *Female calyx* and *nectary* as in the male. *Capsule* three-celled, six-valved, with two seeds in each cell.

Taste herbaceous, with some degree of astringency. Cattle eat it.

III. 2. P. *simplex. Willd* iv. 573.
655 Perennial, diffuse, branches flattened. *Leaves* bifarious, lanceolate. *Female flowers* long-peduncled; *male* sessile. *Anthers* three pair. *Female nectary* a twelve-toothed capsule.

Teling. Uchi userekee.

Like the last, it is a native of dry cultivated ground; but by no means so common. It flowers during the wet and cold seasons.

Root frequently perennial. *Stem* somewhat woody, oblique. *Branches* numerous, diverging from the base of the little stem, spreading closely to the earth, with their apices ascending, many times longer than the stem, striated from the insertions of the leaves, which gives them a compressed appearance. *Leaves* simple, alternate, spreading, bifarious, sessile, linearly lanceolate, smooth, entire; about three-fourths of an inch long, and one-fourth broad. *Stipules* two, obliquely-cordate, withering. *Flowers*, male and female mixed, axillary, generally from one to three of each. The female ones long-peduncled. The male ones nearly sessile. *Calyx* as in the last species, except that in this, there are three distinct filaments, united at the base; and the female nectary is twelve-notched.

Note. This plant agrees so well with Retzius's P. *simplex*, that I dare say, they are the same; he may have changed König's name, or König himself may have changed it from *simplex* to *depressa.*

The natives use the fresh leaves, flowers and fruit, with common seeds, and sugar, of each equal parts, made into an electuary, for the cure of gonorrhœa; a tea-spoonful is given twice a day. The fresh leaves bruised and mixed with buttermilk, make a wash to cure the itch in children.

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* In many of the species it is a very perfect *berry*.

3. P. *gracilis. R.* Page Carey Ed.

Perennial, erect, virgate. *Leaves* bifarious, oblong and cuneate-lanceolate. *Filament* single, capsule three-cleft.

Teling. Userekee.

A rare, somewhat shrubby plant, growing under the shelter of other bushes, and trees. Flowering time the end of the rainy season. III.

Root perennial. *Stem* scarcely any, when present erect, woody, smooth. *Branches* numerous, 656
erect, twiggy. *Leaves* alternate, bifarious, short-petioled, wedge-formed, oblong, or even obcordate, pointed, rounded, or emarginate, entire; from half an inch to an inch long, and about a quarter of an inch broad. *Stipules* cordate, acute, membranaceous. *Flowers* axillary, as in P. *madraspatensis* from which it differs only in being shrubby; whether soil and situation can make the change is with me uncertain; if it can, they are only varieties of the same plant.

4. P. *obcordatus. R.*

Shrubby, erect. *Leaves* simple, alternate, sub-sessile, obcordate cuneate. *Flowers* axillary, peduncled, one female, and two or more male; with a six-leaved calyx. *Filament* single. *Anthers* six.

A native of Bengal. Flowering time the close of the rains, and cold season.

Trunk straight, suffruticose. *Branches* ascending. *Bark* of the woody parts, deep brown, of the tender shoots smooth, green, height of the whole plant about three feet. *Leaves* simple, alternate, sub-sessile, obcordate, cuneate, smooth on both sides, about half an inch long, and considerably less in breadth. *Stipules* semi-cordate, membranaceous. *Flowers* axillary, uniformly one female and several male, all are short-peduncled, and drooping. *Calyx* six-leaved, or six-cleft to the base, alternately smaller, expanding, green, permanent. *Nectary*, none in the female. In the male six minute glands in the fissures of the calyx. *Stamina*, none in the female. In the male, the filament is single, and short. *Anthers* three pair, round the top of the filament. *Pistillum* no rudiment of any in the male. In the female it is round. *Styles* three, short, spreading with stigmas, slightly two-toothed. *Capsules* round, three-celled, three-valved, of the size of a grain of black pepper, smooth. *Seeds*, two in each cell. III.

5. P. *retusus R.* 657

Shrubby, dioecous. *Leaves* obovate, cuneate, sub-retuse. *Flowers* axillary, crowded; *male* pentandrous. *Calyces* five-leaved. *Berries* pendulous, pure white, six-seeded.

A stout, ramous, shrubby species, a native of Bengal, in flower and fruit, in all stages, the whole year.

Trunk scarcely any thing distinct, that can be so called; but several woody, very ramous branches, rise from the root, which spread in all directions; *young shoots* ribbed; and void of pubescence. *Leaves* simple, alternate, short-petioled, obovate-cuneate, rounded at the apex, truncated, or retuse, smooth on both sides, about an inch long, and not so much broad. *Stipules* obliquely triangular, withering. *Flowers* axillary, crowded, minute, pedicelled; the males on one plant, and females on another; when the petals expand the pedicels are considerably lengthened. *Male calyx* five-leaved; *leaflets* oval, concave. *Filaments* five, distinct, of the length of the calyx, alternate with five nectarial scales round the three-cleft, abortive pistil. *Female calyx* as in the male. *Nectary* a slender membranaceous ring round the base of the germ. *Germ* round, three-celled, with two ovula in each, attached to the axis from the middle upwards. *Style* scarcely any. *Stigma* trifid, segments spreading, cuneate, bidentate. *Berries* round, very pure white, smooth, of the size of a small pea, succulent, three-celled. *Seeds* two in each cell, or in all six, separated into pairs by pulpy partitions. *Integuments* two; the exterior one thin, and white; the inner one nuciform, and beautifully pitted. *Embryo* inverse, and curved like the back of the seed. *Cotyledons* two, linear-oblong. *Radicle* sub-cylindric, superior.

It is at all times a handsome shrub, but when its numerous pure white, pendulous berries are ripe, it then becomes particularly conspicuous.

This as well as *Phyllanthus virosus* might better be referred to Willdenow's *Fluggea*, see his edition of the *Sp. Pl.* iv. *p.* 757. but according to what I have observed in his only III.
species, *leucopyrus*, formerly *Phyllanthus leucopyrus*, as well as in this and *virosus*, his essen- 658
tial character of the genus will require a little alteration, viz. *Stylus tripartitus*, *Bacca sexsperma*; all the three are perfectly dioecous; pentandrous, with a five-leaved calyx; no corol, but an acetabuliform nectary; and a round, pure white, succulent, six-seeded berry. The seeds are separated into pairs, by thin pulpy partitions, and are furnished with a perisperm, and a curved inverted embryo.

6. P. *leucopyrus. Kön. Mss.*

Dioecous, shrubby, armed. *Leaves* obovate. *Flowers* axillary, male pentandrous. *Berry* dry, six-seeded.

Fluggea *leucopyrus.*

A large, poor-looking, ramous shrub, a native of the dry barren forests of Coromandel. It flowers chiefly during the rainy season.

Trunk erect. *Branches* numerous, very rigid, spreading in every direction round the trunk. *Bark* ash-coloured. *Thorns* scattered, in a bad soil more numerous, horizontal, large, leaf flower-bearing, they may be called spinous-pointed branchlets. *Leaves* scattered, short-petioled, obcordate, smooth, entire. *Stipules* minute, oval, obtuse. *Flowers* on separate bushes, the female on one, the male on another. In both they are axillary, crowded, peduncled, and very small. *Male calyx* five-leaved, *leaflets* concave. *Corol* none. *Nectarial* glands five, alternate with the insertion of the filaments. *Filaments* five, longer than the calyx. *Anthers*

Page Carey Ed. oval. *Pistil* nothing but a three-cleft column. *Female calyx* as in the male. *Germ* globular. *Style* scarcely any. *Stigmas* three, spreading, two-cleft. *Berry* of the size of a grain of pepper, smooth, dry, three-celled. *Seeds* two in each cell.

Note. The parts of fructification, and its bearing the male flowers on one tree, and female on another, make it, in these respects, nearly agree with P. *virosus*, but the thorns, dis-
III. position of the branches, and leaves declare it a distinct species.
659 7. P. *virosus. Willd.* iv. 578.

Dioecous, sub-arboreous, unarmed. *Leaves* elliptic and oval. *Male flowers* axillary, crowded, pentandrous. *Berries* succulent, white, pendulous, six-seeded.

Up among the Circar mountains, where this chiefly grows, it is frequently a middle sized tree. In the forests of the low countries, it is much smaller, or only a large shrub. It flowers during the hot, and beginning of the wet season.

Trunk erect. *Bark* rust-coloured. *Branches* numerous, ascending; *branchlets* bifarious. *Leaves* simple, alternate, bifarious, short-petioled, oval, entire, smooth, from one to two inches long, and from half an inch to an inch broad. *Stipules* minute. *Flowers* very small. This species is dioecous, the male flowers having always been found on a separate tree from the female. In both they are axillary, crowded, short-peduncled, when in flower erect. *Male calyx*, or *corol* five-leaved; *leaflets* oblong, concave. *Nectary* five yellow glands surrounding the base of the style. *Filaments* five, spreading, inserted between the nectarial glands; *anthers* simple. *Pistil* only a style-like column in the centre with a stellate top. *Female calyx* as in the male. *Nectary* a five-sided ring surrounding the base of the germ. *Germ* ovate. *Styles* three. *Stigma* two-cleft. *Berry* the size of a pea, covered with a white, fleshy pulp, three-celled. *Seeds* two in each cell.

The bark is a strong astringent, and possesses the power of intoxicating fish, when thrown into the water, where they are; which like the berries of *Menispermum cocculus*, renders them easily taken.

SECT. II. *Leaves pinnate.*

8. P. *Niruri. Willd.* iv. 583.

Annual, erect. *Leaflets* oval. *Flowers* axillary, peduncled, one or two male, and one fe-
III. male. *Capsules* smooth, three-celled.
660 Kirganeli. *Rheed. Mal.* x. *t.* 15.

Urinaria *Indica. Burm. Zeyl. t.* 93.

Hind. and *Beng.* Sada-hazur munee.

Teling. Nella userekee.

A common weed in gardens, and on dry cultivated lands, or such as have been lately cultivated.

Root annual. *Stem* erect, from one to two feet high, round, smooth. *Branches* numerous, in large plants the lower spreading to a considerable extent. *Leaves* scattered, spreading, pinnate, from one to three inches long, flower-bearing. *Leaflets* alternate, bifarious, nearly sessile, oval, smooth; about half an inch long, and one-fourth broad. *Stipules* of the petioles three-fold, forming a three-toothed cup round their insertion, each tapering to a fine point; those of the leaflets similar, but one on each side. *Flowers* leaflet-axillary, generally one or two male, and one female, short-peduncled, after flowering time the male drops, and the female droops. *Male calyx* six-leaved. *Corol* none. *Nectary* small, saucer-formed, six-toothed. *Stamens*, one short, columnar filament. *Anthers* three pair. *Female calyx* and *nectary* as in the male. *Capsules* smooth, umbilicated, opening with an elastic jerk, three-celled, six-valved; *cells* two-seeded.

The root tastes bitter, and astringent. The Rev. Dr. John informs me, that he has known the fresh root prove an excellent remedy for the *Jaundice*. About half an ounce, while fresh, was given, rubbed up in a cup of milk, night and morning, the cure was completed in a few days without any sensible operation of the medicine.

9. P. *urinaria. Willd.* iv. 583.

Annual, erect. *Leaflets* linear-oblong. *Flowers* sessile in the exterior axills; *female* solitary in the inferior. *Capsules* scabrous.

Tsjeru Kirganeli. *Rheed. Mal.* x. *t.* 16.

Beng. and *Hind.* Hazar munee.

III. *Teling.* Yerra userekee.
661 This when young is like *Niruri*, grows under the shade of trees. It flowers during the wet and cold seasons.

Root generally annual, though in some soils bi- and even perennial. *Stem* erect, striated, of a pale reddish colour. *Branches* several, ascending, striated from the insertions of the stipules. *Leaves* scattered, spreading, pinnate, from one to two inches long, flower-bearing. *Leaflets* alternate, linear oblong, entire, smooth, three quarters of an inch long, and one quarter broad. *Petioles* compressed, somewhat triangular. *Stipules* of the petioles three-fold, acute, membranaceous; those of the leaflets two, lateral. MALE FLOWERS, exterior leaflets axillary, two or three sub-sessile. *Calyx*, *nectary*, and *stamens* as in *Niruri*. FEMALE FLOWERS, lower leaflet axillary, solitary, sessile. *Calyx* and *nectary* as in the male. *Germ* somewhat murexed, coloured. *Capsule* scabrous, three-celled, six-valved. *Seeds*, two in each cell, transversely striated on the outside.

Note. It is immediately distinguished from P. *Niruri*, by its sessile flowers, and scabrous

capsules. Young plants are deeply tinged with dark, dull red. Cattle eat it. The taste herbaceous. Page Carey Ed.

10. P. *bacciformis. Willd.* iv. 582.

Biennial, diffuse. *Leaflets* remote, pointed, fleshy. *Male flowers* monadelphous. *Female* terminal. *Berries* six-seeded.

Teling. Rawa-sala-burta-kada.

This species is very common in pasture ground near the sea, on the Coromandel coast. It flowers all the year round.

Root biennial. *Stem* or *branches* several, spreading close to the ground, angular, coloured, sometimes woody near the base, from one to two feet long. *Leaves* alternate, spreading, pinnate, flower-bearing, from two to three inches long. *Leaflets* from two to six pair, alternate, remote, oval, somewhat fleshy, pointed. *Stipules* of the petioles three-fold; of the leaflets two-fold. MALE FLOWERS few, in the axills of the inferior leaflets, short-pedicelled. *Calyx* six-leaved; *leaflets* round, laciniate. *Nectary* saucer-shaped, six-parted. *Stamens* a turbinate body in the centre of the nectary, is surrounded by three pair of anthers. FEMALE FLOWERS single in the axills of the exterior leaflets, short-pedicelled. *Calyx* six-leaved, the three interior leaflets ovate, acute. *Germ* turbinate, truncate. *Styles* three, spreading. *Stigmas* three-cleft. *Berry* ovate, of the size of a pea, three-celled, six-valved; *cells* two-seeded. III. 662

11. P. *pendula. Roxb.*

Biennial. *Leaves* long, pendulous, leaflets from ten to fifty pair. The *male flowers* round, in the inferior axills; the *female* ones solitary in the exterior ones.

Teling. Tella userekee.

A most beautiful, somewhat shrubby, erect species, when young not unlike *Niruri*, a native of the same places, but very rare. Flowering time the latter part of the wet season.

Stem biennial, or more, straight, round, smooth. *Bark* green. *Branches* alternate, the inferior ones diverging and long; the superior ones ascending and short; all like the stem, and in old plants twiggy. *Leaves* scattered, nearly pendulous, filiform, pinnate; from four to nine or ten inches long, flower-bearing. *Leaflets* from ten to fifty pair, alternate, short-petiolate, broad-lanceolate, acute, coloured round the edges, smooth, entire; the lower ones are about a quarter of an inch long, and one-eighth broad, the exterior ones much smaller. *Petioles* filiform, flexuose, angular. *Stipules* of the petioles three-fold, those of the petiolets two-fold. MALE FLOWERS spiked, in the axills of the lower leaflets. *Spikes*, when the leaves are young, they scarcely appear, a single flower with the rudiments of one, two or three more, is all that can then be seen, but in old leaves they are very conspicuous, depending, half as long as the leaflets, imbricated with four rows of acute, permanent membranaceous, one-flowered bractes. *Calyx*, *nectary* and *stamens*, as in *Niruri*. FEMALE FLOWERS solitary, from the axills of the exterior leaflets, short-peduncled. *Calyx*, and *nectary*, as in *Niruri*. III. 663

Note. A very large proportion of the female flowers are barren. The taste is herbaceous, with a considerable degree of stypticity.

12. P. *rhamnoides. Willd.* iv. 580.

Shrubby. *Leaflets* oval. *Male flowers* often racemed, and in the inferior axills; *female* solitary, no nectary.

A small shrub, a native of cultivated land, amongst other shrubs, on the coast of Coromandel.

Stem scarcely any. *Branches* many, erect, smooth; *young shoots* angular from the running down of the insertions of the leaves. *Leaves* scattered, spreading, pinnate, flower-bearing, from three to five inches long. *Leaflets* from five to ten pair, alternate, short-petioled, spreading, broad-oval, the exterior ones largest, soft, below whitish, entire, from half to three-fourths of an inch long, and from one-fourth to half an inch broad. *Petioles* angular. *Stipules* of the petioles three-fold, of the leaflets two-fold. MALE FLOWERS racemed. *Racemes* single, from the lower axills, sessile, bowing, imbricated, as in P. *pendula*. *Flowers* very long pedicelled, depending. *Nectary*, six scales on the middle of the leaflets of the calyx pointing inwards, before the flower expands, these cover the anthers like so many hoods; when the leaves are young there appear only one, two or three flowers, and no raceme, but in old leaves it is as conspicuous as in P. *pendula*. FEMALE FLOWERS in the upper axills, single, short-peduncled, bowing. *Calyx* six-leaved; *leaflets* large. *Nectary* none. *Germ* three-horned. *Styles* from the horn of the germ, and not from the centre, each two-cleft. *Stigmas* revolute. *Capsule* globular, of the size of a large pea, crowned with the remaining *styles* and *stigmas*, as in P. *bacciformis*; three-celled, as in the other species.

It is to be distinguished from P. *pendula*, by the general habit of the shrubs, by the length of the leaves, by the form of the leaflets, and lastly by the male flowers having long pedicels; in that there they are sessile. III. 664

13. P. *petiolaris. R.*

Shrubby. *Leaves* pinnate; *leaflets* about five pair, sub-rotund, smooth and entire. *Female flowers* on the common petioles.

A native of the Circar mountains, where it grows to be a stout, ramous shrub.

14. P. *multiflorus. Willd.*

Shrubby, climbing. *Leaflets* oval. *Flowers* of both the sexes with five-leaved calyces, and five-scaled nectaries.

Berries from ten to twelve-seeded.

Hind. and *Beng.* Panjooli.

Niruri. *Rheed. Mal.* x. *t.* 27.

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Teling. Nella-pooroogoodoo.

Phyllanthus *tinctorius. König's Mss.*

A large straggling, or climbing shrub, common in hedges and amongst bushes on the banks of water courses. It flowers most part of the year.

Trunk scarcely any thing that can be so called, but many, very long, straggling, stout woody branches, running through amongst, and over other shrubs, to a very great extent. *Bark* rust-coloured. *Leaves* scattered, spreading, pinnate, flower-bearing; from three to five inches long. *Leaflets* alternate, oval, entire, covered with a very little down; about three quarters of an inch long, and half an inch broad. *Stipules* of the petioles three-fold; those of the leaflets two-fold. *Flowers* leaflet-axillary, small, white, generally one female, and two or more males in the same axill, peduncled, at the flowering time erect, sometimes there is also a small axillary raceme of male flowers, and at others the common petioles end in a raceme. *Male calyx* five-leaved, leaflets oval. *Nectary* five glands placed on the junctures of the leaflets of the calyx. *Filaments* three, unequal; that in the centre is erect, large and bears
III. three anthers; the other two lateral ones are filiform, oblique, and bear one anther each. *Fe-*
665 *male calyx* and *nectary* as in the male. *Styles* one. *Stigmas* minute, in number corresponding with the cells of the berry. *Berry* depressed, umbilicated, dark purple, succulent, from eight to twelve-celled. *Seed*, one or two in each cell, placed one above the other.

15. P. *vitis idæa. Kön. Mss.*

Sub-arboreous. *Leaves* bifarious; *leaflets* oval. *Flowers* axillary. *Calyx* six-toothed, no nectaries, no style. *Berries* succulent.

Katou Nirouri. *Rheed. Mal.* v. *t.* 44.

Beng. Kumkata Joolee.

Yerra pooroogoodoo of the Telingas.

This is one of the most common of the family; it is found wild in every part of India, and seems to thrive well in all soils and situations; but amongst the mountains, it grows to be a tree; whereas in the low lands it is generally a large shrub. It flowers and produces fruit all the year round.

Trunk when a tree, very straight. *Branches* spreading horizontally. *Branchlets* flexuose, bifarious. *Leaves* alternate, bifarious, pinnate, flower-bearing, from five to eight inches long. *Leaflets* alternate, oval, entire, smooth, about an inch long and three-fourths broad. *Petioles* round, flexuose, smooth. *Stipules* of the petioles three-fold, acute, those of the leaflets two-fold. *Flowers;* the male ones from the exterior axills, from two to three-petioled; the female ones from the lower axills, solitary, petioled, at the flowering time erect. *Male calyx* campanulate, margin six-notched; *segments* rounded, inflexed. *Nectary* none. *Filaments* single, clubbed. *Anthers* from three to five affixed to the club by their backs. *Female calyx* one-leaved, small, closely surrounding the lower half of the germ, slightly six-notched. *Nectary* none. *Germ* globular. *Styles* none. *Stigmas* three. *Berry* red.

III. The wood is white, hard and durable. The hill people employ it for various economical
666 uses. Cattle eat the leaves. In drying for the hortus siccus, they always become very black. It is frequently employed for ornamental hedges in gardens, for which end it is well chosen, as its thick, ever green foliage, and constant succession of beautiful red berries, gives it a pretty appearance.

16. P. *turbinatus. Kön. Mss.*

Arboreous. *Leaves* bifarious; *leaflets* oval. *Flowers* axillary, peduncled, the male beyond the female. *Calyx* six-toothed. *Berry* hid in the enlarged coloured *calyx*, six-seeded.

Parin Nirouri. *Rheed. Mal.* v. *t.* 43.

Teling. Dawadaree.

This is a most beautiful species, a large tree growing upon and amongst the mountains of Orissa. It flowers during the hot season.

Trunk erect. *Bark* rust-coloured. *Branches* spreading, horizontal, numerous. *Branchlets* bifarious. *Leaves* alternate, bifarious, pinnate, flower-bearing, about six inches long. *Leaflets* alternate, short-petioled, oval, smooth, entire, about an inch long, and three quarters of an inch broad. *Petioles* round, flexuose. *Stipules* of the common petiole cup-formed, three-toothed, withering; those of the leaflets two, lateral, acute. *Flowers* leaflet-axillary, peduncled. MALE FLOWERS below the female ones, occupying the lower axill, erect in the flowering time. *Calyx* one-leaved, campanulate; mouth six-notched. *Corol* none. *Nectary* none. *Filament* single, clubbed. *Anthers* generally three, though sometimes more, oblong, affixed by their backs to the club of the columnar filament. FEMALE FLOWERS above the male, occupying the middle leaflets; in the flowering time erect, afterwards drooping. *Calyx* as in the male, increasing with the germ, and acquiring a beautiful mixture of red and yellow. *Nectary* none, except the flat crown of the germ be such. *Germ turbinate*, truncate, and somewhat six-lobed. *Style* short, three-parted. *Stigmas* two-cleft. *Berry* sitting in the centre of the enlarged coloured
III. calyx, of the size of a large pea, three-celled; *cells* two-seeded.
667

17. P. *patens. R.*

Shrubby. *Branches* spreading, bifarious. *Leaves* bifarious, alternate, pinnate with twelve or more alternate, short-petioled, oval leaflets in each side. *Flowers* leaflet-axillary; the *female* ones solitary, the *male* ones fascicled in the lower axills. *Berries* erect in the rotate, permanent calyx.

A native of Chittagong, and from thence introduced by Mr. William Roxburgh, Jun. into the Botanic garden, where it is in flower all the year, and a very ornamental shrub it is.

Trunk erect. *Branches* spreading, with numerous approximated, alternate, bifarious, hori-

zontally spreading branchlets. *Bark* of the woody parts dark brown; that of the young parts smooth, deep green. *Leaves* alternate, bifarious, pinnate, spreading, from four to eight inches long. *Leaflets* on each side from five to fifteen, alternate, short-petioled, oval, entire, smooth on both sides, dark green, a little more than half an inch in general length. *Stipules* of the petioles forming a three-toothed cup; those of the leaflets two, semicordate, acuminate. MALE FLOWERS in the axills of the lower leaflets, several together, very fine-peduncled, drooping under the leaves. *Bractes* minute. *Calyx* turbinate, scarcely half the length of the calyx. *Anthers* six or three pair, linear, affixed longitudinally to the club of the filament. FEMALE FLOWERS in the axills of the middle leaflet, the exterior ones being without flowers, solitary, short-peduncled, drooping while in blossom. *Calyx* flat, with a border of six reniform, permanent segments. *Berry* erect on the spreading, enlarged, coloured calyx, three-lobed, smooth, succulent, of the size of a pea, three-celled. *Seeds*, two in each cell. Page Carey Ed.

It is much like P. *vitis idæa*, but in addition to the difference which the description points out, specimens of this species retain their colour when dry, whereas those of *vitis idæa* become remarkably black.

18. *tenellus. Roxb.* III. 668

An erect, delicate, small shrub. *Leaves* pinnate; *leaflets* from eight to ten pairs, oval. *Flowers* axillary, peduncled; one female and several pentandrous male ones; in both a five-leaved calyx, and five-scaled nectary. *Capsule* three-celled, six-valved, with two seeds in each cell. Introduced from the Mauritius in 1802, by Captain Tennant.

Trunk a single, straight, ligneous twig, of three and a half feet in height, with a few still more delicate, erect branches, from the whole plant, which is now five years old. *Leaves* pinnate, alternately scattered round the stem and branches, diverging from two to three inches long. *Leaflets* from six to ten pair, alternate, oval, smooth, and entire; about half an inch long. *Stipules* tapering, acute, those of the common petiole three-fold, those of the leaflets two-fold. *Flowers* two-fold, in the axills of the leaflets, generally one longer peduncled female one, and several shorter peduncled male ones, opening in succession, pale pink, exceeding minute; particularly the male ones. *Male calyx* of five, orbicular leaflets. *Nectary* of five, roundish scales, alternate with the leaflets of the calyx. *Filaments* five, alternate with the nectarial scales, and shorter than the calyx. *Anthers* oval. *Female calyx*, leaflets five, oblong. *Nectary* as in the male. *Capsule* minute, oblate spherical, three-celled, six-valved. *Seeds*, two in each cell. *Perisperm* in considerable quantity; pale, fleshy. *Embryo* inverted, and curved, the two subulate cotyledons point to the lower angle, and the radicle to the apex across the umbilicus.

19. P. *Kirganelia. Willd.* iv. *p.* 587.

Shrubby. *Leaves* pinnate, with from twelve to thirty pair of alternate, oblong leaflets. *Flowers* axillary, peduncled, several monadelphous male, and one female flower together, in both calyx five-leaved, and nectary of five glands. *Berries* many-seeded. III. 669

A native of the Mauritius, from thence introduced into the Botanic garden at Calcutta by Captain Tennant in 1802; where it blossoms the whole year, but rarely ripens its seed in Bengal.

Trunk distinct, straight, and about as thick as a man's wrist; covered with rough, dark greenish, ash-coloured bark. *Branches* numerous, spreading far; the smaller have ther extremities often drooping, and covered with smoother bark than the trunk. Height of the now five-year-old shrubs about eight feet, and expanding much more. *Leaves* alternate, pinnate, from four to six inches long. *Leaflets* from ten to thirty pair, alternate, from oblong elliptic, to lanceolate. *Stipules* thin at the base of the common petioles; and in pairs at the insertion of the leaflets. *Flowers* axillary, several male, and generally one female, very small, reddish. *Calyx* in both of five oblong, concave leaflets. *Nectary* in both five separate glands, within and alternate with the leaflets of the calyx. *Male filament* a single column, dividing into three, four or five, each furnished with a two-lobed anther. *Female germ* ovate, from three to five-celled, with two seeds in each, attached to the top of the axis. *Style* scarcely any. *Stigmas* from three to five, deeply two-cleft; *segments* long, taper, and variously bent, but always spreading back over the germ. *Berries* small, round, dark red, succulent, from three to five-celled. *Seeds* two in each cell, but all seldom come to maturity. *Embryo* inverse, curved and furnished with a perisperm.

A stout handsome shrub, loaded with abundance of delicately small, ever-green foliage. The flowers are too small to add to its beauty, except when narrowly inspected.

20. P. *reclinatus. Roxb.*

Shrubby, scandent, with reclinate branchlets, and leaves. *Leaves* pinnate, floriferous; *leaflets* many, alternate, oval-oblong, with a few male flowers in the lower axills, and one female in the exterior. *Filament* columnar. *Capsule* depressedly turbinate. III. 670

A large, shrubby, somewhat climbing plant; a native of Sumatra, and brought from thence to the Botanic garden by Mr. William Roxburgh, in 1803, where it flowers during the rains chiefly.

Trunk scarcely any, but many long, straggling or climbing, woody branches, clothed with dark brown, smooth bark; *branchlets* reclinate, round, smooth, and green. *Leaves* pinnate, and reclinate, from twelve to thirty-six inches long. *Leaflets* from six to twenty pair, alternate, short-petioled, ovate-oblong, entire, smooth, about an inch and a half long, and less than one inch broad. *Stipules* of the leaves three-fold; those of the leaflets paired. *Flowers* leaflet-axillary, generally several, small, yellow, the male ones in a few of the lowermost axills, and one smaller, shorter peduncled, green female one in the exterior. *Male calyx* turbinate, one-leaved, with a contracted, six-toothed mouth, teeth alternately smaller, and incurvate. *Filament* single, columnar, clavate, with six linear, two-lobed anthers round its upper two-thirds. *Female calyx*

Page Carey Ed. six-toothed ; teeth rounded. *Germ* turbinate, three-celled, with two seeds in each. *Styles* scarcely any. *Stigmas* three, triangular, incurvate. *Capsule* compressed, turbinate, of the size of a pea, smooth, red, three-celled, three-valved, each valve separating into two, from the case upwards as in *Bradleia*. *Seeds* two in each cell, angular, integuments three ; the exterior one a complete, soft, orange-coloured aril ; the second, hard, thick and black ; the interior one membranaceous. *Perisperm* conform to the seed. *Embryo* inverse, curved. *Cotyledons* oblong. *Radicle* cylindric, superior.

21. P. *strictus. R.*

Shrubby, straight. *Leaves* pinnate ; *leaflets* firm, ovate oblong to lanceolate. *Racemes* axillary ; *male calyx* one-leaved ; *female* deeply six-parted. *Capsule* berried.

III. 671 A native of the Malay Islands, to the eastward of the Bay of Bengal.

Stem straight, woody ; *branches* few and erect, particularly while young. *Bark* of the stem dark brown ; the height of the plants in ten years, and they have been full grown for some years, about eight feet. *Leaves* alternate, pinnate, horizontal, or drooping, from six to twelve inches long. *Leaflets* numerous, alternate, short-petioled, broad-lanceolate, entire, smooth, about two inches long, and scarcely one broad. *Racemes* leaflet-axillary, sessile, solitary, short, imbricated with small, cordate, pointed bractes. MALE FLOWERS more numerous than the female ones, peduncled, drooping. *Calyx* one-leaved, peltate, fleshy ; border crenulate ; in the centre are six semi-circular, incurved, fleshy scales, from a triangular excavation, in which the stamens are lodged. *Filament* single, short, three horned. *Anthers* double, at the extremity of each of the horns of the filaments. FEMALE FLOWERS on the same raceme with the male, and of nearly of the same size. *Calyx* six-parted to the base ; *divisions* sub-orbicular, coloured on the inside. *Nectary* none. *Germ* turbinate, truncated. *Styles* three, spreading, each two-cleft. *Capsule* size of a large cherry, smooth, of a beautiful pale rose colour, three-celled, three-valved ; *valves* fleshy. *Seeds*, two in each cell, black, rounded at the base, pointed at top, covered on the inside with a white fleshy aril, and by it affixed to the central receptacle.

22. P. *Emblica. Willd.* iv. 587.

Arboreous. *Leaves* bifarious ; *leaflets* numerous. *Flowers* axillary, and below the leaves. *Calyx* six-leaved. *Drupe* with a three-celled nut.

Emblica *officinalis. Gært. Sem.* ii. 122.

Nilicamaram. *Rheed. Mal.* i. *t.* 38.

Sans. Amlaki. See *Asiat. Res.* iv. 308.

Hind. Amlae.

Beng. Amla.

Tam. Nellekai.

III 672 Myrobalana *Emblica* of the *Materia Medica.*

Teling. Userekee.

A pretty large tree, found cultivated in most parts of India, and also wild in forests. Flowers during the beginning of the hot season ; fruit ripe in eight or nine months after.

Trunk generally crooked, when large as thick as a man's body. *Branches* thinly scattered in every direction ; male branches spreading and drooping. *Bark* ash-coloured, scabrous. *Leaves* alternate, spreading, bifarious, pinnate, flower-bearing, from one to two feet long, and about one and a half or two inches broad, leaflets very numerous, alternate, linear obtuse, entire, smooth, about three-fourths of an inch long, and one-eighth broad. *Petioles* striated, round. *Stipules* small, withering. *Flowers* minute, greenish yellow. MALE FLOWERS very numerous in the axills of the lower leaflets, and round the common petiole below the leaflets, peduncled. *Calyx* six-leaved. *Filament* single. *Anthers* from three to five surrounding the upper part of the columnar filament. FEMALE FLOWERS few, solitary, sessile, mixed with some males in the most exterior axills that bear flowers. *Calyx* as in the male. *Nectary* cup-formed, embracing half the germ, border ragged. *Germ* superior, ovate. *Style* scarcely any. *Stigmas* three, two-cleft, segments a little two-cleft. *Drupe* fleshy, globular, smooth, six-striated. *Nut* obovate, obtusely triangular, three-celled. *Seeds* two in each cell.

The wood of this tree is hard and durable particularly under water. The bark is strongly astringent ; the natives employ it to cure diarrhœas, and to tan leather. The fruit is at all times full of exceedingly sharp juice ; it is eaten raw by the natives, although to an European, the taste is disagreeably acrid. They are pickled, and made into preserve with sugar, and also baked in tarts ; by these means they are more reconcilable to our taste.

23. P. *longifolius. Jacq. Hort. Schonb.* ii. *p.* 36. *t.* 194.

Arboreous. *Leaflets* ovate. *Racemes* drooping. *Calyces* four-leaved. *Male flowers* tetran-

III. 673 drous. *Drupe* with a four-celled nut.

Cicca disticha. *Willd.* iv. 332.

Neli pouli. *Rheed. Mal.* iii. *t.* 47, 48.

Cheramela. *Rumph. Amb.* vii. *t.* 33. *f.* 2.

Beng. Loda, Nori.

Hind. Hurpurori, also Chelmeri.

Averrhoa acida. *Linn. sp. pl.* 613.

Eur. Cheramella.

Teling. Russa Userekee.

An elegant small tree, common in gardens, where it is reared for the sake of the fruit ; I never saw it wild. It flowers about the beginning of the hot season.

Trunk tolerably straight, but short. *Branches* numerous, spreading in every direction. *Bark* ash-coloured, deeply cracked. *Leaves* approximated, numerous, scattered round the extremities of the branchlets, pinnate, often flower-bearing, from one to two feet long. *Leaflets*

numerous, alternate, short-petiolate; the largest about the middle of the leaf, the lowermost nearly orbicular, gradually lengthening to oblong; smooth, entire, waved; from one to three inches long, and from one to one and a half broad; sometimes there are male flowers in the axills of the exterior leaflets. *Stipules* of the petioles three-fold, those of the petiolets two, very minute. *Petioles* round, smooth, tapering, sometimes ending in a short, glomerate raceme of male flowers. *Racemes* numerous, terminal; axillary and from the old germs over the naked branchlets. *Peduncles* flexuose, round, smooth. *Flowers* exceedingly numerous, small, reddish, collected into globular heads over the raceme; also frequently in the axills of the leaflets, and sometimes round the common petioles below the leaflets; *male*, *female* and *hermaphrodite* mixed. *Bractes* three-fold, at every bundle of flowers. *Male flowers* by far the most numerous. *Calyx* of four orbicular, spreading, concave leaflets. *Corol* none. *Nectary* four glands between the insertions of the petals. *Filaments* four, erect, shorter than the corol, anthers two-lobed. *Hermaphrodite* and *female flowers* mixed with the male ones, but fewer. *Corol* and *nectary* as in the male. *Stamens* generally wanting, though there are sometimes one or two, seldom more, and unlike those of the male. *Germ* superior, ovate. *Style* scarcely any. *Stigmas* from three to four, spreading, two-cleft. *Drupe* fleshy, from three to four-lobed, generally four, from six to eight-grooved, of the size of a gooseberry, which they are not unlike. *Nut* from three to four-parted, each part one-celled, and one-seeded.

Page Carey Ed. III. 674

This has much affinity with the *Phyllanthi*, particularly *Emblica;* the Telingas, though no great Botanists, are sensible of it, and call many of them, with this, by the same family name, *Userekee.*

The fruit of this species is more esteemed than that of *Emblica.* The natives therefore call it *Russa Userekee.* They are universally used as an article of food, either raw or dressed in various fashions, also pickled or made into preserves.

24. P. *tetrandrus. R.*

Shrubby. *Leaves* pinnate; *leaflets* numerous, lanceolar. *Flowers* leaflet-axillary, crowded, filiform-pedicelled; *male calyx* four-leaved, and tetrandrous; *female* five.

Angrua, the vernacular name in Silhet where it is found, a small ramous shrub, common in the forests of that country; it blossoms in April and May, and the seed ripens in September.

Young shoots clothed with a small portion of ferruginous pubescence. *Leaves* alternate, and alternately pinnate; lengthening to two feet by the time they are full grown. *Leaflets* numerous, alternate, expanding in succession, short-petioled, broad-lanceolar, entire, smooth, from two to four inches long. *Petioles* round, villous. *Stipules* triangular, two to each petiole and petiolet. *Flowers*, leaflet-axillary, much crowded, filiform, pedicelled, minute, purple, generally male in the lower axills, and female in the superior, though sometimes reverse or mixed. *Bractes* numerous at the base of the filaments, collecting them into bundles. *Male calyx* four-leaved; *leaflets* ovate-lanceolate, laciniate. *Corol* none. *Nectary* four small, roundish, reniform scales alternate with the leaflets of the calyx. *Filaments* columnar, very short. *Anthers* four, linear-oblong, and placed transversely round the apex of the column. *Female calyx* five-leaved; *leaflets* broad-lanceolate, fringed. *Corol* none. *Nectary* a six-lobed, small, saucer-shaped body round the base of the germ. *Germ* three-lobed, three-celled, with two ovula in each, attached to the axis from the middle upwards. *Styles* three, but bifid, and spread over the apex of the lobes of the germ. *Stigma* simple. *Capsule* small, three-lobed, three-celled, six-valved. *Seeds* two in each cell, when all come to maturity. *Perisperm* conform to the seed. *Embryo* inverse, as in the genus.

III. 675

ACALYPHA. Schreb. gen. N. 1461.

Male calyx from three to four-leaved. *Corol* none. *Stigmas* from eight to sixteen. *Female calyx* three-leaved. *Corol* none. *Styles* three, ramous. *Capsules* tricoccous.

1. A. *Indica. Willd.* iv. 523.

Annual, erect. *Leaves* ovate, serrate. *Spikes* longer than the petioles. *Involucre* cowled, and notched, containing from two to four female flowers.

Cupameni, and Wellia Cupameni. *Rheed. Mal.* x. *t.* 81. and 83.

Beng. Shwet busunta.

Teling. Moorkanda.

An annual, very common every where, particularly in gardens, where it is in flower all the year round.

Stem erect, from one to two feet high, branchy, round, smooth. *Leaves* scattered, petioled, ovate-cordate, three-nerved, serrate, smooth, about two inches long, and one and a half broad. *Petioles* as long as the leaves. *Stipules* small, subulate. *Spikes* axillary, generally single, pedunculed, erect, as long as the leaves, many-flowered, crowned, with a body in the form of a cross, the base of which is surrounded with a three-leaved calyx, the arms of the cross are tubular, with their mouths fringed, from the base of the cross on one side, issues a style-like thread, with a fringed stigma. The body of the cross contains an ovate seed-like substance. MALE FLOWERS numerous, crowded round the upper part of the spike. *Calyx* four-leaved, leaflets cordate. *Filaments*, their number I could never ascertain, so exceedingly minute are they. FEMALE FLOWERS below the male, remote. *Involucre* cup-formed, with an opening on the lower side, striated, smooth, toothed, from two to four-flowered. *Calyx* three-leaved.

III. 676

2. A. *ciliata. Willd.* iv. 522. *Vahl*, &c.

Annual. *Leaves* ovate. *Spikes* axillary, shorter than the petioles. *Involucres* notched, one-flowered, ciliate and hairy.

Page Carey Ed.

A rare species, but growing in similar soil with *Indica*. It is also like that, annual, and about the same size.

Leaves as in A. *Indica*, except that they are a little hairy. *Spikes* axillary. FEMALE FLOWERS. *Involucre* one-flowered, toothed, ciliated, hairy.

Note. The same terminal cross is to be found at the extremity of the spike in this species.

3. A. *pilosa. Willd.* iv. 525.

Annual, erect, hairy. *Leaves* long-petioled, cordate, serrate, three-nerved. *Spikes* axillary, as long as the petioles. *Involucre* cup-shaped, dentate, one-flowered.

A native of the Moluccas.

4. A. *amentacea. R.*

Dioecous, shrubby. *Leaves* long-petioled, ovate-cordate, taper-pointed, serrate, three-
III. nerved. *Stipules* ensiform. *Spikes* axillary, as long as the petioles, the male amentaceous.
677 *Involucre* small, hairy, dentate, one-flowered. *Style* multifid.

A native of the Moluccas. It differs from König's A. *betulina* (in *Retz. Obs.* v. *N.* 85.) in having but one female flower in the involucre.

5. A. *chinensis. R.*

Annual, erect, very ramous. *Leaves* rhomb-ovate, crenate. *Involucres* cordate-crenate, on long axillary peduncles. *Male flowers* in a pedicelled head, from the involucre. *Capsules* muricated.

A native of China. From Canton it was sent to the Botanic garden, where it blossoms and ripens its seed during the rains; and perishes at the approach of the cool weather in December.

Stem erect, annual, very ramous, lower branches horizontal and nearly as long as the stem; the superior ones ascending; *cells* clothed with short, appressed, white hairs, one or two feet high. *Leaves* alternate, petioled, rhomb-ovate, crenate, obtuse, three-nerved, pretty smooth. MALE FLOWERS in a small, pedicelled head rising from the base of the involucre. FEMALE FLOWERS from two to three, sessile in the centre of the involucre, immediately about the male pedicel; they expand in remote succession. *Calyx* as in the genus. *Capsules* muricate, and hairy. *Seed, integuments, perisperm* and *embryo* as in A. *virginica, Gært. Sem.* ii. 116. *t.* 107.

6. A. *conferta. R.*

Annual. *Leaves* round-cordate, crenate. *Flowers* axillary, crowded, sessile. *Involucres* from three to four-parted, with from two to three female flowers, proliferous, the exterior one bears a minute head of male flowers. *Capsules* rugose.

A native of China, from thence introduced into the Botanic garden, where it grows, flowers
III. freely, and ripens its seed during the hot season.
678 *Root* annual. *Stem* with many, ascending, round, smooth branches, from twelve to eighteen inches high. *Leaves* long-petioled, round-cordate, obtuse-pointed, three-nerved, crenate, pretty smooth, from one to two inches long. *Involucres* axillary, crowded, sessile, proliferous, from two to three-flowered, from three to four-parted, segments narrow, entire, sub-ciliate. MALE FLOWERS most minute, purplish, collected in a minute head, which springs from the exterior involucre only, the whole including its little pedicel, shorter than the involucre. FEMALE FLOWERS two or three in succession, in each involucre. *Calyx* none, or too minute to be discovered. *Corol* none. *Germ* three-lobed, hairy. *Styles* two or three-cleft. *Capsules* rugose.

7. A. *cylindrica. Roxb.*

Annual, hairy. *Leaves* long-petioled, sub-ovate, obtusely serrate. *Spikes* axillary, solitary, sessile, lower part cylindrical with a one-flowered, deeply dentate, ribbed involucre, minute and male.

A native of the Mauritius, from thence brought to the Botanic garden at Calcutta, where it flowers and ripens its seed more or less the whole year, but chiefly during the rainy season.

CROTON. Schreb. gen. N. 1462.

Male calyx five-leaved, or five-parted. *Corol* five-petalled. *Stamina* various. *Female calyx* generally as in the male. *Corol* as in the male, or none. *Capsule* tricoccous.

1. C. *variegatum. Willd.* iv. 531.

Shrubby, erect. *Leaves* lanceolate, smooth, entire, generally pointed; male flowers with small, ragged, obversely reniform petals, and twenty or more distinct stamens. *Styles* three, undivided.

III. *Tsjera* maram. *Rheed. Mal.* vi. *t.* 61.
679 Codiæum medium chrysosticton. *Rumph. Amb.* iv. *t.* 25. and 26. *f.* 2.
Phyllaurea *Codiæum. Lour. Cochin Ch.* 705.

This elegant, highly ornamental shrub, so far as I have been able to learn, is indigenous only on the Moluccas, and from thence was introduced into the Botanic garden together with the two varieties of the same species, hereafter to be mentioned, where they blossom about the beginning of the rains in June.

Trunk erect and short. *Bark* ash-coloured. *Branches* sub-erect; general height of the whole plant from three to six or eight feet. *Leaves* alternate, petioled, lanceolate, entire, polished on both sides, generally variegated with white or yellow; about six inches long, by one and a half broad. *Petioles* round, smooth, about an inch long. *Racemes* axillary, about as long as the leaves, and so far as I have yet seen, male on one raceme, and female on another. MALE FLOWERS collected in fascicles in pretty long, slender pedicels. *Calyx* five-parted; *divisions* sub-rotund. *Petals* five, somewhat triangular, variously notched, or ragged, shorter by half

than the divisions of the calyx. *Nectarial glands* five, round the stamina, and alternate with the petals. *Filaments* from twenty to thirty, distinct, clavate. *Anthers* seven. FEMALE FLOWERS sub-sessile, solitary. *Calyx* urceolate, five-toothed. *Corol* none. *Nectary* a coloured glandular ring, round the base of the germ. *Germ* conical. *Styles* three, undivided, recurved. Besides the plain green-leaved plant, viz. *Codiæum medium chrysosticton*, we have also from the Moluccas *Rumphius's Codiæum crispum*, *t.* 26. *f.* 2. and his fifth variety, *Codiæum chrysoticton latifolium*, sometimes the variegation partakes of yellow, but red predominates. In this variety the leaves are larger, and tend to be wedge-shaped. The female flowers are short-peduncled, and have the style much shorter than in the first variety. It is a most elegant plant, and delights in the shades of large trees, where the colours are more varied, and brighter. All the varieties are readily propagated by laying. In the Botanic garden they have not yet perfected their seed. Page Carey, Ed. III. 680

2. C. *bractiferum*. *R.*

Shrubby. *Leaves* linear-oblong, smooth, entire. *Racemes* terminal, becoming lateral with an immense orbicular bracte at the base.

Codiæum silvestre. *Rumph. Amb.* iv. *t.* 27.

A native of the Moluccas.

3. C. *dioecum*. *R.*

Leaves alternate, long-petioled, oblong, with the base somewhat cordate. *Racemes* axillary, filiform, much longer than the leaves.

A native of the Malay Archipelago.

4. C. *bicolor*. *R.*

Shrubby. *Branches* proliferous. *Leaves* oblong, ventricose, entire, smooth above, sericeous with stellate scales underneath. *Racemes* terminal, male flowers superior.

A native of Sumatra. Flowering time in the Botanic garden March and April.

Trunk short, soon dividing into many spreading branches, with their divisions proliferous, from three to six-cleft. *Bark* of the old ligneous parts brownish and scabrous, that of the young shoots ferruginous with small, brown, peltate, stellate scales; the whole height of six-years-old plants about six feet. *Leaves* alternate, petioled, oblong ventricose, somewhat cordate at the base, entire, rather obtuse, smooth, green above; gray with numerous, small, sericeous scales underneath; from two to six inches long. *Glands*, two small flat, green ones at the base. *Petioles* from one to two inches long, round, brown with rust-coloured scales. *Stipules* setaceous. *Racemes* terminal, solitary, longer than the leaves, scaly; the *female flowers* occupying the lower fourth; and the male ones the upper three fourths. *Male calyx* five-parted. *Segments* short-ovate. *Petals* five, oblong, woolly. *Filaments* ten, rather longer than the petals. *Anthers* ovate. *Pistillum* none. *Female calyx* five-cleft. *Corol* none. *Nectary* none. *Germ* round, densely clothed with stellate scales, three-celled, with one seed in each, attached to the upper end of the axis. *Styles* three, soon dividing into two long, recurved divisions each. *Stigmas* simple. III. 681

5. C. *plicatum*. *Willd.* iv. 538.

Annual, straggling. *Leaves* roundish-cordate, repand, hairy. *Stamens* monadelphous. *Anthers* fifteen. *Capsules* scabrous.

C. asperum. *Kon. Mss.*

C. tinctorium. *Burm. Ind.* 304. *t.* 62. *f.* 1

Beng. Khoodi-okra.

Annual, and appearing in very great abundance on dried up rice, and other cultivated fields about the latter end of the cool season; the whole plant has a hoary, reddish appearance, and every part is covered with numberless, small, stellate, white hairs, which gives it a hoary look. *Stem* and *branches* several, round, dichotomous, weak, straggling, from one to two feet long. *Leaves* alternate, petioled, broad-cordate, scolloped, waved, with two glands, one in each margin, close to the base, from one to two inches long, and nearly the same breadth. *Racemes* terminal, few-flowered. *Flowers* pale yellow. MALE FLOWERS, about the female. *Calyx* five-leaved. *Corol* five-petalled, linear-lanceolate. *Nectary* none. *Filaments* coalesced. *Anthers* fifteen. FEMALE FLOWERS erect. *Calyx* and *corol* as in the male. The nectary is wanting. *Styles* red. *Capsules* scabrous.

Cloth moistened with the juice of the green capsules, soon becomes blue, after exposure to the open air. They no doubt contain colouring matter, that might be usefully employed, probably similar to that of *Croton tinctorium*.

6. C. *polyandrum*. *R.* III. 682

Shrubby. *Leaves* oval, often lobate, scollop-toothed, projecting glands at the base. *Male flowers* in axillary racemes; the *female* ones sub-solitary, no corol, anthers twin.

Jatropha *Montana*. *Willd.* iv. 563.

Hind. Hakoon.

Teling. Konda-amadum.

A perennial species, a native of the borders of rills of sweet water, and moist high places amongst the Circar mountains. It flowers during the wet and cold seasons.

Stems several from the same root, shrubby, straight. *Branches* few, young shoots a little downy, and round, from three to six feet high. *Leaves* alternate, petioled, oval, sometimes lobate, deeply incised, or coarsely and remotely serrate, a little hairy, three-nerved, with two projecting brown glands at the base, from two to six inches long. *Petioles* round, about an inch long. *Stipules* none, but two glands in their place. MALE FLOWERS racemed, small, of a dull yellow colour. *Racemes* axillary, erect, intercepted. *Calyx* five-leaved. *Corol* none. *Nectary* a membranaceous, yellow ring, surrounding the base of the filaments. *Filaments*

Page Carey Ed. shorter than the calyx, numerous, distinct, compressed, clubbed, with the apices bifid, each bearing two oval anthers. FEMALE FLOWERS peduncled, axillary, one, two, or three, bowing. *Calyx* cylindric, five-toothed. *Corol* none. *Nectary* as in the male. *Seeds* exactly like those of *Ricinus communis*, but much smaller.

The seeds are esteemed by the natives a good purgative; they administer one seed bruised up with water for every evacuation they wish the patient to have; each seed weighs about a grain and a half. They are said to be the real Jamalgata of the Hindoo Physicians. While others, and with more reason, think the flowering C. *Tiglium* to be the real drug.

III. 683 7. C. *Tiglium. Willd.* iv. 453.

Arboreous. *Leaves* ovate, cordate, serrate, pointed, smooth. *Male flowers*, from fifteen to twenty woolly, unconnected stamens. *Female* without corol.

Sans. Jayapala.

Hind. Jamal gata.

Cadal avanacu. *Rheed. Mal.* ii. *t.* 33.

Granum Moluccum. *Rumph. Amb.* iv. *t.* 42.

It grows to be a small tree, from fifteen to twenty feet in height, in the Company's Botanic garden at Calcutta, and in flower most part of the year.

Trunk a little crooked, as thick as a man's thigh. *Bark* smooth, ash-coloured. *Wood* white and hard. *Branches* rather thin. *Leaves* alternate, petioled, ovate-cordate, slightly serrate, pretty smooth, from three to five inches long, and from two to three broad. *Racemes* terminal, erect. MALE FLOWERS above and numerous. FEMALE FLOWERS always single, rather longer, occupying the lower part of the raceme. *Male calyx* five-parted. *Petals* five, oblong, very woolly on the inside, and margin. *Filaments* from fifteen to twenty, distinct, woolly towards the base. *Female calyx* as the male. *Corol* none. *Nectary*, some small glands round the base of the germ.

The tree has a disagreeable smell, the taste of the leaves is exceedingly nauseous and of long duration. Tamul Physicians say the seed of this tree purges effectually and easily, removing all obstructions in the bowels; and that it cures all venereal complaints, and bites of venomous animals.

8. C. *Halecum. R.*

Arboreous. *Leaves* approximate, long-petioled, round, re-entering, cordate, entire, downy underneath, male panicles axillary. *Calyx* three-toothed. *Corol* none.

Halecus alba. *Rumph. Amb.* iii. *p.* 198.

A native of the Moluccas.

III. 684 9. C. *drupaceum. R.*

Shrubby, often scandent, every part scabrous with stellate pubescence. *Leaves* cordate-serrate, two pedicelled glands under the base. *Racemes* terminal, with male flowers on one, and female ones on another. *Nut* three-partible, parts two-valved.

A native of the country about Dacca. Flowers in March, seed ripe in September.

Trunk short, and ill defined. *Branches* many, in a bad soil shorter; in a good soil and protected, long and scandent; *young parts* rough with an immense quantity of short harsh stellate pubescence. *Leaves* alternate, petioled, cordate, cuspidate, unequally and grossly serrate, three-nerved, harsh with stellate hairs, and having two yellow, pedicelled, sub-cyathiform glands immediately under the base, from four to six inches long, and three or four broad. *Petioles* round, about an inch long, harsh. *Stipules* ensiform, sometimes pinnatifid. *Racemes* terminal, simple, generally in pairs, becoming lateral by age, one bearing entirely male flowers, the other female, and sometimes a few male ones at the apex, every part pubescent. *Bractes* subulate, one-flowered. *Flowers* small, of a dull yellowish green colour. *Male calyx* deeply five-cleft, rather shorter than the corol. *Petals* lanceolate, with very woolly margins. *Nectary* five yellow glands, alternate with the petals. *Stamina* numerous, as long as the petals, inserted in a convex, woolly receptacle which occupies the whole centre of the flower. *Female calyx* as the male. *Corol* none. *Nectary* as in the male. *Germ* round, very hairy, three-celled with one seed in each cell, attached to the top of the axis. *Styles* three, each divided near the base into two long, filiform, hairy, variously contorted segments. *Capsules* drupaceous, tricoccous, globose, scabrous, clothed with stellate pubescence, of the size of a large gooseberry. *Cortex*, when dry dividing from the apex into six portions; *nut* thick and very hard, spontaneously three-partible, each portion one-celled, two-valved. *Seed* or rather *nut* solitary, oval. *Integuments* two, the exterior one thick, of a bony hardness, rugose, of a chesnut colour, with a little stellate pubescence on the outside; the inner one a thin, white membrane. *Perisperm* conform to the nut, pale yellow. *Embryo* inverse. *Cotyledons* nearly as long as the perisperm, three-nerved in the fruit of the large variety; oblong-conic in the small variety, sub-rotund. *Radicle* oblong, superior.

III. 685

10. C. *oblongifolium. Roxb.*

Arboreous. *Leaves* oblong, serrate, two glanded at the base, smooth. *Racemes* terminal. *Petals* woolly. *Stamens* twelve. *Capsules* round.

Beng. Buragach.

A small tree, common in forests about Calcutta. Flowering time the beginning of the hot season.

Trunk straight; *bark* ash-coloured, and pretty smooth. *Leaves* petioled, alternate, and thickly set about the ends of the branchlets, spreading or drooping, oblong, serrate, obtuse-pointed, very smooth on both sides, from six to twelve inches long. *Petioles* round and smooth, with a lateral gland on each side of their apices. *Stipules* small, caducous. *Racemes* terminal, generally solitary, erect, shorter than the leaves. *Flowers* solitary, a few female ones mixed

with many male ones, small, of a pale yellowish green. *Bractes* three-fold, one-flowered. *Glands*, on the inside of each of the small, lateral bractes is a round permanent one, as in *Sesamum Indicum*. *Male calyx* deeply five-cleft. *Petals* six, smaller than the calyx, very woolly. *Filaments* twelve, distinct, nine in the circumference and three in the centre; woolly toward the base. *Female calyx* and *corol* as in the male. *Stamens* none. *Germ* globular. *Styles* three, each divided into two very long, variously bent segments. *Capsules* globular, fleshy, six-furrowed, tricoccous. Page Carey Ed.

11. C. *Joufra.*

Arboreous, tender parts scaly. *Leaves* broad-ovate-lanceolate, serrate. *Racemes* sub-terminal, and lateral or axillary, much longer than the leaves. *Male flowers* above, and dodecandrous; *female* below, both with five lanceolate, woolly petals. III. 686

Joufra, the vernacular name in Silhet, where it grows to be a large tree. Flowering time March and April.

Branchlets proliferous; their tender shoots, clothed with minute silver-coloured scales, and no other kind of pubescence. In C. *bicolor*, which this most resembles, the scales are all ferruginous. *Leaves* crowded about the divisions of the tender shoots, alternate, petioled, broad-ovate-lanceolate, serrate, smooth, obtuse with an acumen, having two small flat glands on the base of the rib underneath, as in *bicolor*, but not having the shining silver-like appearance underneath which is in that species, from four to six inches long, and from one to two and a half broad. *Petioles* about an inch long, and scaly. *Stipules* small, subulate, scaly. *Racemes* lateral, axillary and sub-terminal, that is from the forks of the tender twigs, many times longer than the leaves; the lower part of the large sub-terminal ones is occupied by the female flowers, and some male ones mixed; all the rest by the male ones, both sorts have equally long pedicels. *Bractes* small. *Male calyx* deeply five-toothed, scaly on the outside. *Petals* five, lanceolar, woolly on the inside. *Filaments* twelve, longer than the petals. *Anther* ovate. *Female calyx* and *corol* as in the male. *Stamens* none. *Germ* oval, three-celled, one ovulum in each, attached to the upper end of the axis. *Styles* three, divided nearly to the base. *Stigma* simple.

JATROPHA. Schreb. gen. N. 1463.

Male calyx five-parted. *Corol* from one to five-petalled. *Stamina* about ten. *Female calyx* and *corol* as in the male. *Styles* three, bifid. *Capsules* tricoccous.

1. J. *Curcas. Willd.* iv. 560. *Asiat. Res.* xi. 169.

Shrubby. *Leaves* broad-cordate, five-angled, smooth. Both male and female with a five-cleft calyx and five-petalled corol. III. 687

Beng. Baghbarinda.

Teling. Napalam.

This is one of the most common small trees or bushes on the coast of Coromandel, and in flower and fruit all the year.

Trunk irregular, from being constantly kept low for hedges. *Wood* soft and spongy. *Bark* smooth, light ash-coloured. *Leaves* scattered, petioled, broad-cordate, five-angled, smooth, about six inches each way. *Petioles* round, smooth, from four to six inches long. *Stipules* none. *Panicles* terminal, or from the exterior axills, cymose, bearing many small, yellow flowers. The male flowers at the extremities of the ramifications, on short, articulated pedicels, and the female ones in their divisions, with their pedicels not articulated. *Bractes* a small one below each sub-division of the panicle, and generally one pressing on the calyx. *Male calyx* five-leaved. *Corol* five-petalled, campanulate, somewhat hairy. *Nectary* of five glandular bodies, round the base of the filaments. *Filaments* six, the central one very thick, columnar; the five exterior ones filiform, towards the base adhering to the central one, all erect, and a little longer than the calyx. *Anthers* ten, sagittate, equal; five supported by the large central filament, and one by each of the others. *Female calyx*, *corol* and *nectary* as in the male. *Germ* oblong, smooth. *Styles* three, short. *Stigma* bifid, somewhat hairy. *Pericarpium* and *seed* as in the genus.

The wood of this tree, or rather bush, is too soft and spongy to be of any use, it will not even burn freely.

The leaves warmed, and rubbed with castor oil are by the natives applied to inflammations where suppuration is wished for. An oil is expressed from the seed, which is only used to burn in lamps, by the poorer classes of the natives. The seeds taken inwardly act with great violence both upwards and downwards, and are therefore almost exploded from the Hindoo *Materia Medica*. They are seldom or never administered by our Medical Gentlemen. III. 688

2. J. *glandulifera. Roxb.*

Calycled, sub-arboreous. *Leaves* palmate, base cordate, smooth, lobes from three to five, lanceolar, oblong, acutely serrate, each serrature ending in a headed bristle. *Petioles* naked. *Stipules* bristly, many-cleft. *Flowers* panicled, monadelphous, sub-octandrous.

This stout shrub is to be met with in a few gardens about Calcutta, where, in from six or seven years they have grown to be from four to eight feet high; from whence they came I cannot learn; but as the juice is used medicinally, I suspect the plant to be well known, if not indigenous at no great distance.

The trunk is short, soon dividing into dichotomous branches with smooth, swelled, ash-coloured bark. From fresh wounds there issues much thin, clear, pale yellowish juice.

Leaves about the extremities of the branchlets, alternate, petioled, generally palmate; *lobes* from three to five, oblong, the two posterior ones are much smaller than the other three,

Page Carey Ed. all are serrate, with each serrature ends in a short, green, glandular-headed bristle, from four to six inches each way. *Petioles* as long as the leaves, round, and smooth. *Stipules* bristly, many-cleft, each division ending in a glandular head. *Panicles* terminal, about as long as the leaves. *Bractes* bristly. MALE FLOWERS most numerous and terminal, small, of a pale greenish yellow colour. *Calyx* five-cleft to the base, sometimes ciliate. *Corol* ample, campanulate. *Petals* cuneate, conjoined toward the base, and there woolly on the inside.* *Nectary* five green glands round the base of the conjoined filaments. *Filaments* about eight, conjoined. *Anthers* twin. *Pistillum*, no rudiment of one, the staminiferous column occupying its place.

III. 689 FEMALE FLOWERS few, and sub-sessile in the divisions of the panicle. *Calyx* and *corol* as in the male. *Nectary*, five scales round the base of the germ. *Styles* three, with enlarged, ragged stigmas. *Capsule* tricoccous, of the size of a filbert, and smooth. *Seeds* oblong, smooth, light green, crowned with a glandular body by which they are attached to the receptacle. *Embryo*, as in the other *Euphorbiæ*.

I am inclined to think this differs from Vahl's *Jatropha glauca*, though I cannot finally settle that point as I am not acquainted with that plant, except this be it; however the above description is so full, and I can safely say accurate, as to enable any one who may have an opportunity of comparing them, to determine. This is always a stout shrub, and never in any part pubescent; indeed from the whole of Vahl's description now before me, I am inclined to think them different species.

The pale or whey-coloured thin juice which exudes from a fresh wound of this plant, is employed by the Hindoos as an escharotic to remove films from the eyes.

RICINUS. Schreb. gen. N. 1464.

Male calyx four or five-leaved, or four or five-parted. *Corol* none. *Stamina* numerous. *Female calyx* three or five-parted. *Corol* none. *Styles* three, two-cleft. *Capsules* tricoccous.

1. R. *communis. Willd.* iv. 564.

Leaves peltate, sub-palmate, serrate. *Fruit* prickly.

Sans. Eranda.

Teling. Amadum.

Hind. Arend, Arendi, or Arindi.

Beng. Bherenda.

Of this very useful plant, we have several varieties cultivated in India, some of them growing to the size of a pretty large tree, and of many years duration; I have not seen any

III. variety with smooth fruit.

690 On the leaves the domesticated Arrindy silk-worm *(Phalæna Cynthia,)* are fed. See *Transactions of the Linnæan Society, vol.* vii. *p.* 42.

2. R. *mappa. Linn. sp. pl.* 1430.

Dioecous. *Leaves* peltate, cordate, entire, acute. *Spikes* panicled.

Acalypha Mappa. Willd. iv. 526.

Folium *Mappa. Rumph. Amb.* iii. *t.* 108.

One plant of this, a handsome small tree, with hitherto male blossoms, sprung up amongst some plants from Amboyna, introduced into the Botanic garden in 1798, where it flowers in July.

Trunk straight and perfectly erect. *Bark* and large branches, smooth and ash-coloured. *Branches* tending to be verticelled, ascending and spreading. *Branchlets* round, smooth, and glaucous. Height of the tree, now eleven years old, thirty-five feet. *Leaves* alternate, petioled, cordate, peltate, margins slightly waved, smooth on both sides, but very paler-coloured underneath, from numerous most minute, whitish dots. There are generally two, or three lanceolate smooth glands in as many of the smallest superior nerves; veins numerous, from six to twenty-four inches long, and nearly of the same breadth. *Petioles* nearly as long as the leaves, round, smooth, glaucous. *Stipules* cordate, reniform, acute, glaucous. *Panicles* of male flowers, axillary, erect, ramification alternate. *Bractes* alternate, sessile, cordate, concave, dentate, ciliate, many-flowered. *Flowers* numerous, very small, pale green. *Calyx* two-leaved, or deeply two-parted, reflexed. *Corol* none.

3. R. *dicoccus. Roxb.*

Arboreous. *Leaves* cordate, often lobate, repand-serrate. *Racemes* terminal, panicled. *Capsules* smooth, dicoccous.

Folium calcosum. *Rumph. Amb.* iv. *p.* 129. *t.* 64.

III. Some plants were received into the Botanic garden at Calcutta from Amboyna in 1798.
691 Now, in 1808 they have grown to be small trees, about twenty feet high. Flowering time from April to June.

Trunk tolerably straight, about as thick as a man's thigh. *Bark* smooth, of a light ash-colour. *Branches* few, spreading; *young shoots* ascending, round and covered with minute grains. *Leaves* alternate, long-petioled, broad-cordate, and while the trees were young generally with three acute lobes, margins scollop-serrate, when they first unfold a little mealy, but by the time they are full-grown, smooth on both sides, with a cluster of small, dark coloured glands at the base of the upper side, about six inches each way. *Petioles* nearly as long as the leaves, round, smooth. *Stipules* very minute. *Racemes* terminal, nearly compound, indeed it may often be called a panicle. *Flowers* pedicelled, from one to three or even more together; *male* and *female* mixed, but the former by far the most numerous, small, of a

* Without strict examination, the corol may be taken for a petalled one.

greenish yellow colour. *Bractes* subulate, mealy. *Male calyx* four or five-cleft; divisions expanding, broad-lanceolate, mealy on the outside. *Corol* none. *Nectary*, none visible. *Filaments* very numerous, inserted into a hemispheric gland. *Anthers* linear, twin, with a common obovate gland at the top. *Female calyx* five-cleft. *Corol* none. *Nectary* a small flat receptacle, with a crenulate margin on which the germ rests. *Germ* two-lobed, clothed with stellate pubescence, two-celled, with one ovulum in each, attached to the top of the axis. *Style* two-cleft; *divisions* recurvate. *Stigmas* simple. *Capsule* dicoccous, each consisting of two valves, which open from the base. *Seeds* solitary, round, rugose, of a dark brown, about the size of a grain of pepper, affixed to the apex of a slender central receptacle. Page Carey Ed.

SAPIUM. Schreb. gen. N. 1469.

Male calyx from two to four-parted. *Corol* none. *Stamina* from two to four. *Female calyx* from three to four-parted. *Corol* none. *Germ* superior, from two to three-celled; *cells* one-seeded; *attachment* superior. *Style* three-cleft. *Capsule* bi-tricoccous. *Embryo* inverse, and furnished with a perisperm. III. 692

1. S. *Indicum. Willd.* iv. 572.

Arboreous, branchlets often ending in a spine. *Leaves* alternate, broad-lanceolate, serrate, smooth. *Male flowers* amentaceous, triandrous. *Female* ones solitary. *Capsules* drupaceous.

Beng. Hoorooa.

Bengieiri. *Rheed. Mal.* iv. *t.* 61.

A small tree, a native of the Delta of the Ganges. It flowers at various seasons, and ripens its seed in from twelve to eighteen months afterwards. The branches are numerous, spreading in every direction, and covered with smooth, ash-coloured bark. The smaller short ones from the trunks, and longer branches often ending in a strong sharp thorn.

Leaves alternate, petioled, sub-pendulous, broad-lanceolate, serrate, smooth, of a deep shining green, from two to four inches long, and broad in proportion. *Stipules* small, caducous. MALE FLOWERS on terminal, cylindric aments. *Scales* of the ament glandular, from three to four-flowered. *Calyx* three-parted; *divisions* sub-cordate, expanding. *Corol* none. *Filaments* longer than the calyx. *Anthers* ovate. FEMALE FLOWERS at the base of the aments, often solitary. *Calyx* from three to four-parted. *Corol* none. *Germ* above, ovate. *Styles* three-cleft, divisions entire, and recurved. *Stigma* enlarged. *Capsule*, or *nut* globular, of the size of a nutmeg, three-celled, six-valved, thick and exceedingly hard. *Seed* solitary, affixed by the apex, oval, smooth.

The juice of this tree is reckoned of a very poisonous nature. The taste of the fruit is nauseous beyond description. The seeds are used by the natives for the nefarious purpose of intoxicating fish. III. 693

2. S. *sebiferum. R.*

Arboreous. *Leaves* broad-rhomb-ovate, pointed, waved, entire, smooth, male flowers triandrous.

Croton *sebiferum. Linn. sp. pl.* 1425.

Stillingea *sebifera. Willd.* iv. 588.

Beng. Mom-China.

Is now very common about Calcutta, where, in the course of a few years it is become one of the most common trees. It is in flower and fruit most part of the year.

Trunk straight; *bark* ash-coloured, considerably cracked. *Branches* numerous, the larger ones nearly erect, the smaller ones spreading, with their extremities often beautifully pendulous. *Leaves* scattered, petioled, rhombic, pointed, margins waved, smooth on both sides, about two inches each way. *Petioles* nearly as long as the leaves, slender, channelled, smooth, with two glands on the upper side of the apex. *Stipules* caducous. *Racemes* terminal, cylindric. MALE FLOWERS fascicled, very numerous, small, yellow. *Calyx* irregularly three-toothed. *Corol* none. *Nectary* none. *Filaments* from two to three, very short, not connected. *Anthers* double. FEMALE FLOWERS large, three or four below the male. *Calyx* as in the male. *Corol* none. *Nectary* none. *Germ* oblong. *Styles* three, undivided. *Capsule* of the size of a cherry, tricoccous, smooth. *Seeds* enveloped in a white sebaceous substance.

In Bengal it is only considered as an ornamental tree; the sebaceous produce of its seeds is not in sufficient quantity, nor its qualities so valuable as to render it an object worthy of cultivation. Cocoa-nut oil is better for the lamp, and it is only during very cool weather that this substance becomes firm; at all other times it is in a thick, brownish, fluid state, and soon becomes rancid. Such is my opinion of the famous vegetable tallow of China.

3. S. *cordifolium. Roxb.* III 694

Arboreous. *Leaves* cordate-serrate, cuspidate, three-nerved, with glands in the axills of the nerves on the under side, and stipuled at the base. *Male flowers* octandrous, with a bifid calyx.

Teling. Badeki.

A small tree, a native of moist vallies among the Circar mountains.

Trunk straight. *Branches* and *branchlets* nearly erect. *Bark* pretty smooth. *Leaves* scattered, petioled, cordate, acuminate, serrate, three-nerved, below downy, with yellow glands between the origin of the nerves, above pretty smooth, from four to twelve inches long, and from three to eight broad. *Petioles* from two to four inches long, round, smooth, coloured. *Stipules* of the petioles subulate, caducous; those of the leaves subulate, recurved and permanent. *Female racemes* terminal, one or two. *Male racemes* several from the germs over the

Page Carey Ed. last year's naked branchlets below the leafy shoots, all erect and filiform, from two to six inches long.

Note. In some specimens I have found the male and female flowers on the same raceme, the male above and the female below. *Bractes* in both three-fold; the male ones many-flowered the female ones one-flowered. *Male calyx* with the segments kidney-formed, spreading. *Corol* none. *Filaments* eight, short, tapering, spreading, united near the base into a flat, saucer-like body. *Anthers* oval. *Female calyx* below, six-parted; *segments* narrow, acute. *Corol* none. *Germ* ovate; *style* short. *Stigmas* three, long, thread-formed. *Capsules* three-celled, three-valved. *Seed* solitary.

4. S. *baccatum. R.*

Leaves ovate-oblong, acuminate, entire. *Berries* two-seeded.

Billa the vernacular name in Silhet, where it is indigenous, and grows to be a large and
III. useful timber tree. Flowering time March and April; seed ripe in August.
695 *Branchlets* crowded, ascending and particularly smooth. *Leaves* petioled, alternate, broad-ovate lanceolate, acuminate, entire, glossy; from three to six inches long, by from one and a half to two and a half broad, having no glands at the base, but the margins are a little swelled where they join the petiole. *Petioles* from one to two inches long, smooth. *Stipules; male aments* terminal and axillary, slender and simple, the terminal ones sub-panicled, the axillary ones solitary, as long as the leaves. *Bractes* or *scales* of the ament cucullate, many-flowered, with an oblong gland on each side, as observed by Jussieu in his account of the habit of the genus *sapium. Flowers* very minute, pedicelled. *Calyx* four-toothed. *Corol* none. *Filaments* two, very short; *anthers* two-lobed, opening in the sides. *Racemes; female flowers* on a different tree, terminal and axillary, but fewer and shorter than the male. *Flowers* solitary, pedicelled. *Bractes* and *calyx* as in the male. *Corol* none. *Stamina* none. *Germ* superior, round, compressed, two-celled, with one ovulum in each attached to the top of the axis. *Style* none. *Stigmas* two, recurved. *Berries* globular, of the size of a small gooseberry, smooth, purple, two-celled. *Seed* solitary, of the size of a betel nut, unequally oblong, the inside being straighter. *Integuments* two, the exterior one fibrous; the inner one somewhat nuciform, brittle, dark brown. *Perisperm* conform to the seed, very oily. *Embryo* inverse. *Cotyledons* oval, nearly as broad and long as the perisperm, three-nerved. *Radicle* superior, large, oval.

BRADLEIA. Schreb. gen. N. 1474.

Male calyx six-leaved in a double series. *Corol* none. *Anthers* a few round the apex of a central column. *Female calyx* from six to twelve-leaved, in a double series. *Style* none or short. *Germ* superior, many-celled; *cells* from one to three-seeded; *attachment* internal. *Stig-*
III. *ma* perforated at the top, with a many-lobed ray, corresponding with the cells in the germ.
696 *Capsule* many-celled, many-valved. *Seeds* arilled, from one to three in each cell. *Embryo* erect and furnished with a perisperm.

1. B. *multilocularis. Roxb.*

Arboreous. *Leaves* broad-lanceolate, entire, smooth. *Flowers* axillary, both sorts peduncled. *Capsules* compressed, umbilicate, from ten to fifteen-celled.

Agyneja *multilocularis. Willd.* iv. 569.

A small ramous tree, a native of Bengal, and in blossom from April till October. Is nearly allied to Dr. Buchanan's *Agyneja coccinea.* See *Col. Symes' Embassy to Ava.*

Trunk tolerably erect, covered with pretty smooth, brownish gray bark. *Branches* numerous, down to the ground, spreading with bifarious, often drooping branchlets. *Young shoots* smooth. *Leaves* alternate, short-petioled, oblong, entire, smooth on both sides; from two to three inches long. *Stipules* subulate. *Peduncles* axillary, from one to three or more together, short, one-flowered. *Bractes* axillary, numerous, round the insertion of the male and female peduncles. *Male* and *female flowers* often in the same axill. *Male* smaller and deeper yellow. *Male calyx* six-parted to the base, three are exterior, and rather longer. *Filaments* in the centre, forming a single cylindric receptacle with from eight to twelve, linear grooved anthers adhering to it. *Female calyx* from six to twelve-leaved; the inner series, or alternate divisions rather smaller, all sub-cordate, entire, smooth, and permanent. *Stamina* none. *Germ* depressed, from ten to fifteen-lobed, united in a verticel, from ten to fifteen-celled, with two ovula in each, attached to the inner angle of the cell. *Style* none. *Stigma* fleshy, funnel-formed, with its round fleshy margins marked with as many ribs as there are cells in the germ. *Capsule* about an inch in diameter, depressed, with the apex and base concave, sides torulose, smooth,
III. from ten to fifteen-celled, composed of two distinct tunics, opening round the base, and up the
697 sides; the exterior one generally divides into as many segments, or valves, as there are cells, the inner one is of the colour and consistence of parchment, and divides into double the number of portions, these drop off together, leaving the seeds in pairs, in a circle round the large convex receptacle to which they are attached, and separated by very thin, white partitions, which were united to the inflected margins of the inner tunic of the capsule. *Seeds* two in each cell, obovate, flattened, sharp on the inner edge, enveloped in a soft, whitish, pulpy aril, which is covered with an orange-coloured pellicle. *Integuments, proper,* nuciform, rugose. *Umbilicus* an elevated point on the inner edge. *Perisperm* soft, of a pale azure colour. *Embryo* straight, nearly as long and broad as the perisperm. *Cotyledons* two, round-cordate. *Radicle* cylindric, pointing directly to the umbilicus, viz. inferior.

2. B. *lanceolaria. R.*

Arboreous, smooth. *Leaves* short-petioled, lanceolar, obtusely acuminate, glossy. *Flowers* axillary, the male ones numerous, and long-peduncled, the female ones few and sessile. *An-*

thers from four to six; in a sessile head; *germ* about six-celled. *Style* lengthened. Page Carey Ed.

Angooti, the vernacular name in Silhet, where it is indigenous, and grows to be a large, useful timber tree; the wood being hard and durable is often employed by the natives in constructing their habitations. It ought to be compared with Cavanilles' *Bradleia Philippica* See B. *Philippensis. Willd.* iv. 592.

Tender shoots glossy, in habit tending to erect and straight. *Leaves* alternate, short-petioled, from narrow-lanceolar to oblong, entire, firm and glossy, acuminate, from three to six inches long, by from one to two broad. *Stipules* triangular, permanent. MALE FLOWERS long-peduncled, and collected in a crowded fascicle in the lower axills, or from those of last year, also mixed amongst the few sessile female flowers in the exterior axills, colour of both sorts pale greenish yellow. *Calyx* in both ♂ and ♀ six-leaved; the exterior three longer, in the male oblong, in the female tapering from the base. *Filaments* very short. *Anthers* from four to six-lobed, linear. FEMALE FLOWERS sessile. *Germ* ovate, six-celled, with two ovula in each, attached to the thick axis. *Style* short and thick. *Stigma* six-lobed; *lobes* pointed and incurved. *Capsule* much depressed, turnip-shaped, with a concave apex and base, grooved, six-celled, twelve-valved. *Valves* composed of two distinct coats; the exterior one smooth, rather spongy and olive-coloured; the interior one like hard thin parchment, these open from the base, warp, and soon drop off, leaving the red seed attached to the clavate receptacle or axis. *Seeds* two in each cell, attached to the clavate axis, a full half of each on the side where two meet is filled with a soft yellow pulp when recent, which on drying disappears, and leaves a vacuum, coloured by the two exterior integuments almost exactly as in *Bradleia Sinica, (Gært. Sem.* ii. 127. *t.* 109.*)* which I might have supposed this to be, had I not now before me König's very excellent description and figure of that species in the first volume of his *Annals of Botany, p.* 356 *pl.* 7. *f.* 4. *Integuments* three; the exterior one red, polished and glossy; the second one like parchment; and the interior one thin and brown. *Perisperm* soft completely covering the embryo. *Embryo* inverse. *Cotyledons* obliquely ovate, cordate, thin. *Radicle* superior, with its apex at the umbilicus. III. 698

3. B. *impuber. R.*

Arboreous. *Leaves* sub-sessile, oblong, entire, smooth. *Flowers* axillary, pedicelled. *Style* none. *Stigma* perforated with a many-ribbed ray. *Capsule* turbinate.

A native of the Moluccas, agreeing well with the description of the *Agyneja impuber* in the *Mantissa,* except that the peduncles and the little roundish bractes round their insertions are smooth.

4. B. *pubera. R.* III. 699

All the tender parts more or less downy. *Leaves* short-petioled, oblong, entire, umbellets solitary, sessile above the axills. *Germ* round, and crowned with a large, roundish, six-lobed stigma. *Capsule* depressed, both sides umbilicate, six-celled.

Agyneja *pubera. Linn. Mant.* 296. *Willd.* iv. 569.

A native of the Moluccas. The male and female flowers are mixed in the same umbellets and supported on pedicells twice or thrice their length.

5. B. *hirsuta. R.*

Shrubby, all the tender parts very hairy. *Leaves* obliquely cordate-oblong, obtuse. *Peduncle* axillary, short, many-flowered. *Capsule* six-seeded.

A native of Prince of Wales' Island.

6. B. *nitida. R.*

Sub-arboreous. *Leaves* sessile, ovate-oblong, acute, shining, smooth. *Umbellets* above the axills. *Capsules* globular, five-celled.

Teling. Yeati-palla.

A small tree or large shrub, a native of the moist vallies amongst the Circar mountains. It flowers during the cold season.

Trunk erect with a large shady head. *Bark* scabrous, dark-coloured, astringent. *Branches* sub-erect. *Branchlets* bifarious, smooth. *Leaves* short-petioled, bifarious, ovate, oblong, acute, entire, smooth, of a shining deep green; from four to eight inches long. *Stipules* small, acute. *Umbellets* very short-peduncled, far above the axills, bearing many male and female flowers mixed, but always a very large proportion of female ones. MALE FLOWERS pedicelled. *Calyx*; *leaflets* six, three of them standing within the other three, and alternate with them. *Corol* none. *Anthers* linear, from five to six pair, affixed to the middle of the short, gibbous, five or six-toothed column. FEMALE FLOWERS more numerous, pedicelled. *Calyx* as in the male. *Style* none, or most short; apex perforated, with the margins of the perforation from five to six-cleft. *Capsules* sub-globular, small, apex a little compressed, from five to six-celled, from ten to twelve-striated, and from ten to twelve-valved. *Seeds* two in each cell. III. 700

7. B. *Sinica. Willd.* iv. 591.

Shrubby, erect, tender parts hairy. *Leaves* bifarious, oblong, acute, entire, hairy underneath. *Flowers* axillary, fascicled. *Style* rather long; *stigma* trifid with the lobes bidentate. *Capsule* six-celled.

Arbuscula Sinica, &c. *Pluk. Alma. p.* 35. *pl.* 7. *t.* 368. *f.* 1.

Found by Mr. Roxbourgh, in the forests of Pulo Pinang under the shade of large trees; in flower and with ripe seed in July.

8. B. *pinnata. Roxb.*

Arboreous. *Leaves* scattered, pinnate; *leaflets* alternate, numerous, oblong. *Capsule* from eight to twelve-celled; *cells* one-seeded.

Reared in the Botanic garden at Calcutta, from seed sent from Pulo Pinang by Mr. C. Smith. In twelve years it has grown to be a tree of considerable magnitude, and is in blossom most part of the year.

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Trunk straight. *Bark* smooth, ash-coloured. *Branches* numerous in every direction, forming a large, dense, roundish head; height of the tree forty feet. *Leaves* scattered round the ends of the branches, pinnate, lengthening, as in many of the *Phyllanthi*, to two or more feet. *Leaflets* very numerous, alternate, petiolate, obliquely oblong, entire, somewhat villous underneath; from one to two inches long, and less than one broad. *Petioles* and *petiolets* round and downy. *Stipules* of the leaflets small, cordate, pointed. *Flowers* axillary, drooping,
III. generally several male and one female together, the former small and yellow, upon longer
701 slender peduncles, the latter short-pedicelled. *Male calyx* six-leaved. *Nectary* none. *Filaments* single, swelled above the middle, to which part five anthers are fixed by their backs. *Female calyx* nearly as in the male. *Nectary* none. *Germ* villous, ovate. *Style* scarcely any. *Stigma* large, with the margin from eight to twelve-cleft. *Pericarp* fleshy, of the size of a cherry, dividing spontaneously into as many parts as there were segments in the stigma. *Seeds* generally one to each division of the pericarp.

It has the habit of a *Phyllanthus*, but the natural character is that of *Bradleia*.

MONOECIA SYNGENESIA.

TRICHOSANTHES. Schreb. gen. N. 1476.

Male calyx five-toothed. *Corol* five-parted, fringed. *Filaments* three. *Female calyx* and *corol* as in the male. *Style* three-cleft. *Pepo* oblong.

1. T. *anguina. Willd.* iv. 598.

Annual, scandent. *Leaves* more or less five-lobed. *Male flowers* racemed; *female* solitary. *Pomes* spindle-shaped.

Beng. Chichinga.

Anguina *Sinensis. Mil. t.* 32. is but a very bad representation of our Indian plant.

Much cultivated in the warmer parts of Asia, for its fruit, which is universally eaten by the natives in their stews and curries. I have never met with the plant in its wild state. A variety was raised from seed sent from Nepal by Dr. Buchanan, the leaves of which are more deeply divided, and the fruit longer than those of the southern parts of India, but in other respects they are the same.

III. 2. T. *dioeca. R.*

702 Dioecous, herbaceous. *Pomes* oblong, smooth. *Seeds* globular. *Leaves* cordate, dentate, scabrous; both male and female flowers solitary.

Sans. Putulika.

Beng. Putal.

Hind. Pulwul.

This is by far the most useful species of *Trichosanthes* I am yet acquainted with. It is much cultivated by the natives about Calcutta, during the rains. It is unknown on the coast of Coromandel.

Root perennial. *Stems* creeping and running to a great extent, five-sided, scabrous. *Leaves* alternate, petioled, cordate, dentate, scabrous, when young soft. *Petioles* woolly, variously bent, channelled. *Tendrils* simple, or two-cleft. MALE FLOWERS on a separate plant, axillary, solitary, on pretty long peduncles. *Tube* of the corol very long, trumpet-like; *stamens* three, distinct. FEMALE FLOWERS axillary, solitary, short-peduncled. *Corol* large, with the fringe ample. *Pomes* oblong, both ends obtuse, when ripe smooth, and of a deep orange colour, about four inches long, and the same in circumference. *Seeds* globular, with a somewhat callous border. The unripe fruit and tender tops are much eaten both by Europeans and natives in their curries, and are reckoned exceedingly wholesome.

3. T. *cucumerina. Willd.* iv. 600.

Pomes ovate, acute. *Leaves* broad-cordate, from three to five-lobed, margins toothletted. *Male flowers* racemed; *female* ones solitary.

Pada valam. *Rheed. Mal.* viii. *t.* 15.

Teling. Aduvee-putla.

A pretty extensive, climbing annual, a native of hedges, &c. where it has shelter. It flowers during the cold season.

Stem five-sided, slightly downy. *Tendril* three-cleft. *Leaves* broad-cordate, angular and
III. sometimes lobed, toothed, downy, very various in size. MALE FLOWERS racemed, small, white,
703 beautifully fringed. *Racemes* axillary, erect, longer than the leaves, many-flowered. FEMALE FLOWERS axillary, solitary, short-peduncled like the male ones. *Fruit* oval, or oblong, pointed, cells imperfect, from one to four inches long, and from an inch to an inch and a half in diameter, till ripe striated with white and green, when ripe red. *Seeds* involved in a red pulp, lobate.

The unripe fruit is eaten in stews, by the natives, it is exceedingly bitter, for which it is reckoned the more wholesome, and is said to be *anthelmintic.*

4. T. *lobata. Roxb.*

Pomes linear oblong, smooth. *Leaves* downy, from five to seven-lobed; *lobes* scollop-toothed. *Male flowers* racemed. *Female* solitary.

Beng. Bun-chichinga.

This plant grows in hedges, and among bushes. It flowers during the wet season.

Stems five-sided, somewhat hairy, running to a great extent. *Leaves* petioled, from five to seven-lobed; *lobes* obovate, scollop-toothed, of a soft downy texture; from six to seven

inches each way. *Tendrils* three-forked. *Female flowers* racemed, white. The female ones soli- Page
tary, and white also. *Pomes* linear oblong, smooth, ornamented lengthways except near the Carey
base, with ten white streaks. *Seeds* each surrounded with its own proper gelatinous, bright Ed.
red nidus.

This is never eaten, although it appears to be a useful species.

5. T. *cordata. R.*

Root perennial, tuberous. *Pomes* globose, smooth, of the size of an orange. *Leaves* cordate, and cordate-lobate. *Male flowers* racemed; the *female* ones solitary.

Boomee-Koomura of the Hindoos near the mouth of the river Megna, where the plant grows wild, and its root is used by the natives, as a substitute for Colomba root. It has by mistake I presume, been sent to London as the real Colomba of Mozambique. III.

Root tuberous, perennial, growing to the size of a man's head. *Stems* herbaceous, climb- 704
ing to the length of some fathoms, five-sided, villous, or even somewhat scabrous when old. *Tendrils* opposite, three-cleft. *Leaves* alternate, petioled, cordate and cordate-lobate, finely dentate, villous on both sides, about six inches each way. *Petioles* channelled, a little hairy, scarcely half the length of the leaves. *Male raceme* axillary, solitary, as long as the leaves. *Bractes* alternate, sessile, cuneate, oblong, acute, serrulate, one-flowered. *Flowers* large, white, the fringe of the segments coarser than in the other species known to me. FEMALE FLOWERS axillary, solitary, short-peduncled. *Pome* spherical, of the size of an orange, and of nearly the same colour, only redder, and as in T. *palmata*, which it is much like, the cells and partitions are very obscure. *Seeds* numerous, immersed in soft, gelatinous, green pulp.

6. T. *palmata. Roxb.*

Perennial. *Fruit* globular, smooth. *Leaves* palmate; *lobes* acute, sub-lanceolate. *Male flowers* racemed; *female* ones solitary.

Beng. Mukhal.

Teling. Kaki-danda.

A large, climbing perennial; a native of forests, where it runs over the highest trees. It flowers during the hot and rainy seasons.

Stem angular, covered with gray, scabrous, somewhat corky bark, the young green parts smooth. *Tendrils* three-cleft. *Leaves* scattered, petioled, generally palmate, though sometimes only from three to five-lobed; *divisions* acute, slightly serrate, from three to five-nerved, smooth, having frequently several round, glandulous, hollow spots on the under side. *Petioles* channelled. *Stipules* single, small, axillary. MALE FLOWERS racemed, large, white, most beautifully fringed with long, white, ramous filaments. *Racemes* axillary, longer than III.
the leaves. *Bractes* solitary, one-flowered, oval, fringed, covered on the outside with dark 705
green glandulous spots. *Calyx* bracte-like. FEMALE FLOWERS generally axillary, peduncled, though sometimes racemed also. *Fruit* globular, smooth, of the size of a small orange, when ripe of a bright deep red, replete with a dirty looking, dark greenish, soft pulp, in which the seeds nestle.

The fruit is reckoned poisonous, and I am told it is mixed with rice and employed to destroy crows.

7. T. *heteroclita. R.*

Perennial, scandent. *Leaves* from three to five-lobed; *male flowers* racemed; *female* ones solitary, or racemed. *Pepo* sub-globular, containing as many as six large, two-lobed, nuciform seeds.

Goolur of the natives of the Silhet district.

A native of the eastern parts of Bengal. From Silhet Mr. Robert Keith Dick, the Judge of that district, sent plants to the Botanic garden in 1805, where they blossom during the greater part of the year, and the seed ripens in October. Now, 1811, the original plants sent by Mr. Dick are of many fathoms extent, running to the top of high trees, yet continuing to increase rapidly, and do not by any means appear to have attained their full size.

Root ramous, as in most other plants. *Stems* one or several from the same root, perennial, climbing to a great extent, up and over large trees. *Bark* of the old ligneous parts olive-coloured, and somewhat cracked; that of the young shoots smooth, and a little furrowed. *Leaves* alternate, petioled, from three to five-lobed, from three to five-nerved, smooth on both sides, having the lobes entire, oblong, or triangularly ovate, acuminate, from six to twelve inches each way. *Petioles* shorter than the leaves, nearly round, reddish, and smooth. *Stipules* solitary, sub-axillary, thick, short, conical, coloured. MALE FLOWERS. *Racemes* axillary, solitary, about the length of the leaves, smooth, of a deep brown, bearing several alter- III.
nate, sub-sessile, very large flowers near the apex. *Bractes* solitary, oblong, acute, thick, and 706
firm. *Calyx* one-leaved, funnel-shaped clothed on the outside with much ferruginous, mealy pubescence; *mouth* five-toothed, with one, two, or three smooth, elevated, chesnut coloured, small glands on the outside of each tooth. *Corol* five-parted, inserted on the mouth of the calyx; *segments* sub-obcordate, retuse, with an acute point in the centre, having half of the outside, which was exposed to the weather before expansion, coloured brown, the rest pale yellowish white; the exterior margins wonderfully perforated and fringed with most beautiful, very long, spiral, pendulous, villous, yellow threads. *Filaments* three, from the mouth of the tube of the calyx under the corol, clavate. *Anthers* united, forming a broad inverted cone; variously grooved with the polliniferous, worm-like cells. *Pistillum* not any appearance of this organ. FEMALE FLOWERS sometimes on a distinct plant. *Peduncles* axillary, cylindric, dark brown, rather more than one inch long, one-flowered. Sometimes, though rarely, they are also on a raceme, which is very short compared with that of the male flowers. *Calyx* and *corol* as in the male. *Stamina* none. *Germ* inferior, broad-cordate, deep brown, studded with

Page Carey Ed. elevated, paler coloured specks, one-celled, containing six pairs of ovula attached to the base of the three receptacles, and separated by much spongy, juicy pulp. *Style* the length of the tube of the calyx and adhering to it, except at the base and apex. *Stigma* large, three-lobed; *lobes* emarginate. *Berry* oblately spheroidal, somewhat villous, apex somewhat pointed, of the size of a shaddock, being about five or six inches in diameter, when dry, brittle, one-celled. *Seeds* six, when all come to maturity, which is common, sub-reniform, unequally two-lobed; the fertile lobe about three inches long, by nearly two broad, and about one in thickness, convex or circular on the exterior edge, straight on the inner one, with the apex round-
III. ed. and the base less so; the abortive lobe is much smaller, but of the same form. *Integu-*
707 *ments* three, the exterior one a perfect, very hard, ligneous, porous, villous nut; in its base is a slit, or opening through which the base of the next integument passes; the middle one thick and spongy particularly before perfect maturity, in that state it may be taken for a perisperm; the exterior one membranaceous, and slightly reticulate. *Perisperm* no other than the middle gray spongy envelope of the seed. *Embryo* erect. *Cotyledons* conform to the cell of the exterior integument, thick, firm, white. *Plumula* of two unequal lobate lobes. *Radicle* conic; inferior.

MOMORDICA. Schreb. gen. N. 1477.

Male calyx five-toothed. *Corol* five-parted, or five-petalled. *Female calyx* and *corol* as in the male. *Style* trifid. *Pepo* fleshy, bursting when ripe with or without elastic force. *Seeds* enveloped in a soft aril.

1. M. *Charantia. Willd.* iv. 602.

Leaves palmate, having nerves. *Peduncles* solitary, with a round, reniform bracte at or below the middle. *Fruit* lengthened, tubercled, tapering at both ends. *Seeds* with a thick notched margin.

Pandi-pavel. *Rheed. Mal.* viii. *t.* 9.

Amara-indica. *Rumph. Amb.* v. *t.* 151.

Beng. Korilla.

Teling. Korella.

Cultivated in all the warmer parts of Asia for the fruit, which the natives eat, while unripe, in their curries. The fruits are bitter and reckoned wholesome.

2. M. *muricata. Willd.* iv. 602.

Leaves palmate. *Peduncles* solitary, with a reniform bracte near the base. *Fruit* gibbous, muricated, with tubercles between, tapering at both ends. *Seed* with a thick notched margin.

III. Pavel. *Rheed. Mal.* viii. *t.* 10.

708 *Sans.* Soosavi.

Beng. Oochya, or Oochi.

Hind. Bura-korilla.

Cultivated by the natives of India, even more extensively than *Charantia.* The fruit, though much smaller, being more esteemed. It is found in abundance in every market.

3. M. *monadelpha. Roxb.*

Dioecous. *Leaves* angle-cordate, smooth. *Corols* campanulate. *Filaments* single. *Fruit* smooth.

Bryonia foliis cordatis. *Flor. Zeyl. N.* 356.

B. foliis sub-rotundis. *Burm. Zeyl.* i. 19. *f.* 1, 2.

Vitis alva indica. *Rumph. Amb.* v. *t.* 166. *f.* 1.

Sungs. Vimba.

Beng. Tela-koocha.

Bryonia *grandis. Willd.* iv. 617.

Teling. Kaydonda.

A native of every hedge in the country, and seems to thrive equally well in every soil. It is always dioecous.

Root ramous, not tuberous. *Stems* climbing, running over trees, and bushes, five-sided, perennial, scabrous. *Tendrils* lateral, simple. *Leaves* alternate, petioled, cordate, five-angled, with a few minute teeth round the margin, smooth, having one, two, or three hollow glands, under the base, from two to three inches each way. *Petioles* round, smooth, about half an inch long. *Peduncles,* in both the male and female plants, axillary, single, undivided, one-flowered. *Flowers* large, white, downy on the inside. *Male calyx,* and *corol* as in the genus. *Filament* single, columnar, short. *Anthers* creeping up and down, sometimes three of the convolutions are elevated considerably above the rest. *Female flowers* on a separate plant. *Calyx* and *corol* as in the male. *Stamens,* there are only the rudiments of three filaments. *Style* single, short. *Stigma* three-cleft; *segments* double. *Berry* smooth, two inches long, and one in diameter, before ripe marked with ten streaks of white; when ripe red, three-celled,
III. bursting irregularly. *Seeds* numerous as in *Cucumis.*
709 The ripe fruit is eaten raw by the natives, and while green in their curries. Crows and other birds are fond of them.

4. M. *dioeca. Willd.* iv. 605.

Dioecous, root perennial, tuberous. *Leaves* from three to five-lobed, scabrous. *Petioles* without glands. *Male* and *female flowers* solitary, the former cowl-bracted. *Fruit* ovate, muricate, bursting. *Seeds* a few.

Bem paval. *Rheed. Mal.* viii. *t.* 18.

Pooagakara is the Telinga name of the male plants, and Agakara of the female. Page Carey Ed.
They are natives of thickets, and banks of rivers, where there are bushes for them to run on. Flowering time the wet and cold seasons.

Root tuberous, large, perennial, with somewhat of an astringent taste. *Stems* annual, five-sided, slender, smooth, about as thick as a log line, running to the extent of one or two fathoms. *Tendrils* simple. *Leaves* scattered, petioled, from three to five-lobed, irregularly toothed; above a little scabrous, below pretty smooth. MALE FLOWERS on a different plant, axillary, solitary, large, yellow, long-peduncled. *Peduncles* with a large, gibbous, striated, blown up spathe-like bracte at the apex, which encloses the bottom of the flowers *Corol, petals* lanceolate. FEMALE FLOWERS axillary, solitary, peduncled, large, of a pale yellow. *Peduncles* about as long as the petals, near the base there is a small sheathing bracte. *Fruit* about the size and shape of a partridge's egg, murexed. *Seeds* many, oval, gray; each surrounded with a large, pulpy, crimson aril.

The natives eat the tender, green fruit in their curries; also the tuberous roots of the female plant; they are larger than those of the male, generally weighing from two to three pounds.

5. M. *mixta. Roxb.* III.

Dioecous, root tuberous, perennial. *Leaves* sub-palmate, smooth; *petioles* with glands. 710
Male and *female flowers* solitary and corol-bracted, with glands on the lower margins of the bractes. *Fruit* oval, sharply murexed.

Sans. Kurkuta.
Hind. Kakrool.
Beng. Gol-kakra.
Muricia Cochin Chinensis. *Lourier. Cochin Ch.* 733.

This plant is a native of thickets about Calcutta. Flowering time the wet season. Like M. *dioeca* it has male flowers on one plant, and female ones on another.

Root tuberous, perennial. *Stems* annual, climbing, somewhat five-sided, smooth. *Tendrils* simple. *Leaves* petioled, from three to five-lobed, or palmate, sometimes serrate, smooth on both sides, from four to six inches each way, with the lobes oblong. *Petioles* channelled, with an uncertain number of umbilicate, green glands scattered over them. MALE FLOWERS axillary, solitary, on long peduncles, or racemed, large, of a dirty whitish cream colour. FEMALE FLOWERS axillary, solitary. *Bractes* solitary, large, two-lobed, cowled, embracing the calyx as in *Momordica dioeca. Lobes* striated, a little scabrous, having lower margins fringed with many green glands. *Male calyx* of a dark blackish purple, striated, and scabrous. *Corol* five-petalled, campanulate, with the side downy, and the bottom marked with three-coloured spots. *Filaments* and *anthers* marked with the same dark purple colour, which prevails on the calyx. *Female calyx* and *corol* as in the male. *Pistillum* as in the genus.

6. M. *umbellata. Roxb.*

Dioecous, root perennial. *Leaves* from cordate-sagittate to three or five-lobed, bristle-toothed; *male flowers* sub-umbelled; the *female* ones solitary. *Fruit* oblong, many-seeded; *seeds* round.

Beng. Kooduri.
Hind. Amoot-mool or Turuli. III.
Bryonia *umbellata. Willd.* iv. 618. 711
Teling. Teed danda.

This plant is a native of hedges and forests. Flowering time the wet season.

Root perennial, consisting of many pendulous tubers. *Stems* climbing to a great extent, five-sided, smooth. *Tendrils* simple. *Leaves* petioled, halberted, angle-cordate or three-lobed; *lateral lobes* often two-parted, all minutely bristle-toothed, pretty smooth, from three to four inches each way. *Stipules* solitary, clubbed. MALE FLOWERS umbelled, always on a distinct plant. *Umbels* axillary, simple, shorter than the leaves; *pedicels* bracted above the middle. *Corol* gibbous, smooth, five-toothed. *Receptacle* as in *Cucumis.* FEMALE FLOWERS axillary, single, peduncled. *Corol* as in the male. *Fruit* oval, the size of a pigeon's egg, smooth, red. *Seeds* from sixteen to twenty, sub-globular.

The ripe and unripe fruit are eaten by the natives, as are also the roots when boiled.

7. M. *tubiflora. Roxb.*

Leaves roundish, angles obscure. *Female flowers* solitary; the *male* ones solitary, longer peduncled or racemed, with gashed bractes. *Tube* of the male corol long and gibbous. *Fruit* oblong, with ten hairy ribs.

A native of the forests about Dacca. From thence the late Colonel Peter Murray sent the seeds to the Botanic garden, where the plants blossom during the rains, and ripen their seed in two, or three months afterwards.

Root perennial. *Stems* creeping to an extent of many feet, slender, five-sided, somewhat rough with short hair. *Leaves* roundish, three or five-lobed, or angular, margins acutely toothletted, scabrous with harsh hairs on both sides. *Flowers* axillary, very large, pure white. The male ones solitary, and on a long peduncle while the plants are young, but when advanced, on long peduncled, axillary spikes with large, gashed, one-flowered bractes. The female III.
ones solitary, short-peduncled, smaller. *Corol* that of the male with a long gibbous tube, that 712
of the female shorter, and subcylindric. *Border* of five, large, spreading, obovate divisions. *Stamens* within the tube. *Style* the length of the tube. *Stigma* three-cleft. *Fruit* one-celled, oblong, ten-ribbed, rough with short stiff hairs, particularly the ribs, about two inches long, by three quarters of an inch in diameter, when ripe, orange coloured, bursting slowly, exposing the smooth thick marginal seeds disposed in three rows and enveloped in a soft dark

Page Carey Ed. greenish aril.

LUFFA. Tournf.

Male calyx five-toothed. *Corol* five-petalled. *Filaments* generally three. *Female calyx* and *corol* as in the male. *Pepo* inferior, becoming dry and inwardly fibrous, opening by the falling or decay of a lid at the apex.

1. L. *pentandra. Roxb.*

Leaves angular lobate, or palmate. *Stamens* five. *Fruit* linear, marked with ten straight lines like ridges. *Seed* with elevated dots and sharp waved margins.

Petola. *Rumph. Amb.* v. *t.* 147.

Momordica *Luffa. Willd.* iv. 603.

Cattu picinna. *Rheed. Mal.* viii. *t.* 8.

Beng. Doondool.

Purula Kindi and *Tita purula*, a wild variety.

Teling. Nuni-beerd.

I have only found this plant in its cultivated state. It is considerably larger than *acutangula* in all its parts, and is cultivated at the same season.

Tendrils from four to six-cleft. *Leaves* alternate, petioled, the lower ones five-angled with the angles acute, the superior ones palmate; *segments* conic, lanced, very acute; all slightly serrate, pretty smooth, from six to twelve inches each way. *Petioles* striated, a little channelled. *Stipules* solitary, axillary, cordate, glandular as in L. *acutangula*. MALE FLOWERS racemed, as in L. *acutangula*, but in this species the lowermost flower of the raceme is often female. *Bractes* as in L. *acutangula*. *Filaments* five, distinct. *Anthers* sub-equal, contorted, worm-like. FEMALE FLOWERS solitary, peduncled, axillary or the lowermost on the raceme. *Calyx* five-leaved, glandular. *Nectary* five-lobed, glands with woolly insertions. *Stigma* four-lobed. *Fruit* linear, smooth, striated, with ten deeper coloured streaks, but no elevations, from one to three feet long, and about three inches in diameter; internal structure as in the former. *Seeds* gray, with elevated dots; margin sharp, waved.

III. 713

The unripe fruit is eaten by the natives in their curries, like that of the former species, but is not so much esteemed. The seeds are generally sown by the root of a tree, on the huts of the natives, over which the plants run.

2. L. *acutangula. Roxb.*

Stems slender and smooth. *Leaves* five-angled, dentate, pretty smooth. *Fruit* short, clubbed, with ten sharp ridges. *Seeds* pitted.

Cucumis *acutangulus. Willd.* iv. 612.

Picinna. *Rheed. Mal.* viii. *t.* 7.

Hind. Turai.

Beng. Jhinga.

Luffa *foetida. Willd.* viii. 380.

Ghorla-beera, or beerkay of the Telingas, for it is known equally well by either name in that country. It is very generally cultivated by the natives during the wet and cold seasons. I have never found it wild.

Stems several, slender, running to a great extent but with fewer branches than any other species that I know, pretty smooth, five-sided. *Tendrils* three-cleft. *Leaves* as in *Cucumis sativus*, but less rough. *Stipules* axillary, solitary, cordate, with glandular marks on one side. MALE FLOWERS pretty large, yellow, on long, erect, axillary racemes, the pedicels have a glandular bracte near the base, and are articulated a little above it. FEMALE FLOWERS rather larger, axillary, solitary, peduncled. *Fruit* clavate, obtuse, pretty smooth, ten-angled; *angles* sharp but smooth, about a foot long, and from two to three inches in diameter; when ripe dry and replete with dry fibres. *Seeds* black, irregularly pitted.

III. 714

The half grown fruit is one of the best native vegetables we have in India; the natives use it much in their curries; when peeled, for the skin is hard, boiled, and dressed with butter, pepper, and salt, they are little inferior to green pease.

Note. There is the rudiment of a lid at the apex of the fruit of the species, but it never separates spontaneously; this circumstance is to be attended to, to distinguish it from *Cucumis operculatus.*

3. L. *clavata. R.*

Leaves superficially from five to seven-angled, the posterior lobes rounded, margins minutely-dentate. *Male flowers* on long peduncled racemes; the *female* ones solitary; *fruit* clavate, very long and slender.

A native of the interior parts of Hindoosthan. The seeds were sent by Colonel Alexander Kyd at Allahabad to the Botanic garden at Calcutta, where the plants blossom and produce fruit during the cold season.

Stem scandent, several fathoms long, five-sided, smooth. *Leaves* slightly from five to seven-lobed; posterior lobes rounded, the rest more acute, margin slightly dentate, pretty smooth on both sides, about six inches each way, when full grown. *Flowers* very long, of a deep yellow. The male ones on axillary, long-peduncled racemes. The female ones axillary, solitary, supported on peduncles about the length of the germ. *Bractes* of the male flowers solitary, one-flowered, oval, small, fleshy, glandular, inserted on the pedicel. *Fruit* pendulous, of a long, slender, clavate shape, three-celled, when ripe dry, and the partitions composed of dry fibres. *Seeds* numerous, thin, sharp-edged, lodged in the thickened part of

III. 715

the fruit near the apex. The young unripe fruit is eaten by the natives in their curries, and other stews. Page Carey Ed.

4. L. *amara. R.*

Stems slender. *Leaves* slightly from five to seven-lobed. *Male flowers* racemed; the *female* ones solitary. *Fruit* oblong, with ten sharp ridges.

Beng. Kerula.

Teling. Sheti beera.

This species grows wild in hedges and dry uncultivated places. It flowers during the latter part of the rains and the cold season.

It is *Cucumis indicus striatus opercula donata,* of Plukenet, *t.* 172. *f.* 1. which is a very good figure of it.

Stems, leaves, inflorescence, and *flowers* as in *Luffa acutangula. Fruit* oblong, three or four inches long, and one in diameter, tapering equally towards each end, ten-angled, as in L. *acutangula,* when ripe, dry, of a gray colour, and replete with the same dry fibres; the lid or stopple which till then shuts up the apex drops off and the seeds fall out. *Seeds* of a blackish gray colour, marked with elevated minute black dots.

Every part of this plant is remarkably bitter, the fruit is violently cathartic and emetic. The juice of the roasted young fruit is applied to the temples by the natives to cure headach. The ripe seeds either in infusion or substance are used by them to vomit and to purge.

5. L. *racemosa. R.*

Annual. *Leaves* round cordate, five-sided. *Racemes* axillary, minute, ineffective, male flowers below, and many fertile hermaphrodite ones over the rest. *Fruit* short, cylindric, obtuse, smooth, and marked with five flat longitudinal ribs. III. 716

Cultivated in the interior parts of Bengal, for its esculent fruit, which like those of *pentandra, acutangula* and *clavata,* are eaten in their immature state.

6. L. *graveolens, Roxb.*

Leaves reniform, and scollop-toothed. *Fruit* oblong, beset with soft innocent prickles while short papillæ, and short hairs closely clothe the interstices.

A native of the Rajmahl hills, from thence the seeds were brought to the Botanic garden, where the plants blossom during the rainy season, and the seed ripens about three months afterwards.

Stems running, as in the common cucumber, and nearly as long as they, more slender, and somewhat villous. *Tendrils* from three to four-cleft. *Leaves* reniform, somewhat lobed, and always scollop-toothed, surface armed with a few minute denticuli. *Flowers* axillary, male and female mixed, and blossoming in succession, though it rarely happens that more than one of the female flowers are productive. The male blossoms are larger and sub-sessile, the female short-peduncled, with one or two glandular, sub-rotund bractes on each. *Fruit* oblong, about the size of a man's thumb, armed with numerous, conical, soft, innocent points, and between them covered with short hairs and little papillæ; when ripe dark, of a brownish black, containing many black, oval, compressed seeds, mixed with dry white fibres, as in L. *acutangula,* &c.

The whole plant has a most disagreeable, heavy smell.

7. L. *echinata. Roxb.*

Dioecous, scandent. *Leaves* about five-lobed, scollop-toothed. *Male flowers* racemed. *Female* ones solitary. *Fruit* oval, echinate, with straight, long bristles.

A native of the coast of Coromandel. It flowers about the close of the rains. The seed ripens during the cold season.

Stems herbaceous, scandent, five-sided, most slightly hairy, one or two fathoms long. III. 717
Tendrils two-cleft. *Leaves* generally five-lobed, somewhat hairy, particularly the nerves, and veins on the under side; margins scollop-toothed. *Petioles* as long as the leaves, ribbed. *Stipules* axillary, solitary, oblong, glandular. MALE. *Racemes* axillary, solitary, longer than the leaves, bearing many small, white flowers, on long pedicels. *Petals* obovate. *Filaments* three, two with twin anthers. FEMALE. *Peduncles* axillary, solitary, shorter than the petiole, one-flowered. *Petals* as in the male. *Style* three-cleft; *divisions* two-parted. *Fruit* oval, of the size of a nutmeg, armed with numerous, long, rather soft, diverging bristles, obscurely divided into three cells, by numerous dry fibres; opening at top with a stopple. *Seeds* several, ovate, compressed, scabrous, black.

8. L. *Bindaal. R.*

Dioecous, scandent. *Leaves* five-angled, dentate. *Male flowers* racemed; the *female* solitary; *fruit* round, echinate, with long, firm, straight, ciliate bristles.

Found by Captain Hardwicke in Hindoosthan.

9. L. *tuberosa. R.*

Root tuberous and perennial. *Leaves* from five to seven-lobed, dentate. *Male flowers* on very short racemes; the *female* ones solitary, long-peduncled. *Fruit* oblong, with eight sharp ridges.

This is a rare species; it grows in hedges, and amongst bushes on the banks of water courses.

Root perennial, tuberous, turnip-shaped, with small warts over it, and here and there fibrous roots from these warts. *Stems* slender, five-sided, climbing, smooth. *Tendrils* simple. *Leaves* cordate, from five to seven-angled, toothed or serrate, smooth, about two inches each way. MALE FLOWERS a few on short, axillary racemes, white. *Filaments* two, one bearing three anthers, and the other two. FEMALE FLOWERS axillary, solitary, long-peduncled, white. III. 718
Fruit as large as that of *L. amara,* but without the stopple, and with only eight

Page Carey Ed. angles, about an inch and a half long, and half an inch in diameter; internal structure as in the last described three species.

CUCURBITA. Schreb. gen. N. 1478.

Male calyx five-toothed. *Corol* five-cleft. *Filaments* three. *Female calyx* and *corol* as in the male. *Seeds* with a tumid margin.

1. C. *lagenaria. Willd.* iv. 606.

Leaves somewhat angular, tomentose, bi-glandular at the base underneath. *Fruit* with a woody cortex.

Bela-schora. *Rheed. Mal.* viii. *t.* 1.

Cucurbita Lagenaria. *Rumph. Amb.* v. *t.* 144. bad.

Beng. Kudoo, Laoo.

Sans. Ulava.

A wild bitter variety is called Tita Laoo, by the Bengalees and Hindoos; and Kutoo toombee in Sanscrit.

The shape of the fruit varies much, from that of a flask to round, and cylindric.

2. C. *Pepo. Willd.* iv. 609.

Leaves angular, toothed, very downy. *Fruit* sub-cylindric, both ends obtuse, surface very even.

Cumbulam. *Rheed. Mal.* viii. *t.* 3.

Sans. Kurkaroo.

Beng. Koomra.

Teling. Boorda-goomoodoo.

This plant I have only found in a cultivated state.

Root annual. *Stem* and *branches* numerous, &c. as in C. *Melo-pepo* but exceedingly hairy. *Tendrils* lateral, generally three-cleft. The first or lower leaves angular, the exterior
III. from five to nine-angled, all toothed, remarkably soft and downy, from four to six inches long,
719 and about the same breadth. *Petioles* round, tapering, hairy. *Stipules* axillary, solitary. MALE FLOWERS axillary, solitary, peduncled, yellow, pretty large. *Calyx*, its segments obtusely pinnatifid. FEMALE FLOWERS like the male, axillary, solitary, peduncled. *Calyx* as in the male. *Fruit* sub-cylindric, without the least elevation or depression of its surface, remarkably obtuse at both ends, when young exceedingly hairy, by the time it is ripe the hair is gone, and it is then of a whitish bloom colour, about twelve or eighteen inches long, and from eight to ten in diameter. *Seeds* white, with tumid margins, somewhat two pointed.

The young unripe pomes are universally eaten by the natives in their stews, and curries.

3. C. *melopepo. Willd.* iv. 610.

Leaves angular-lobed, dentate, hairy; *divisions* of the calyx petioled. *Fruit* roundish, smooth, torulose.

Schakeri-schora. *Rheed. Mal.* viii. *t.* 2.

Suphura-koomra of the Bengalees.

Cultivated like the former two all over India.

4. C. *Citrullus.*

Leaves many-parted.

Anguria Indica. *Rumph. Amb.* v. *t.* 146.

Hind. Turbooz or Turmooj.

Extensively cultivated in all the southern parts of Asia, and its islands.

CUCUMIS. Schreb. gen. N. 1479.

Male calyx five-toothed; *corol* five-parted. *Filaments* three. *Female calyx* and *corol* as in the male. *Seeds* sharp.

1. C. *Colocynthis. Willd.* iv. 61.

Leaves many-cleft. *Fruit* globular, smooth.

Pers. Chebooz or Khirboo-lekh.

III. *Teling.* Sheti-putsa.

720 *Beng.* Makhal.

Common on the sandy lands of Coromandel.

2. C. *Melo. Willd.* iv. 613.

Angles of the leaves rounded. *Fruit* roundish, torulose, smooth.

Hind. Pers. and *Beng.* Khurbooj.

Found in a cultivated state only.

3. C. *sativus. Willd.* iv. 615.

Leaves straight between the angles. *Fruit* linear-oblong, scabrous.

Mullen belleri. *Rheed. Mal.* viii. *t.* 6.

Hind. Keera.

Beng. Susa.

Pers. Khyar.

This and some of its varieties are found cultivated in most parts of Asia.

4. C. *momordica. R.*

Leaves round-cordate, sometimes five-angled, scollop-toothed; *male flowers* fascicled; the *female* solitary. *Fruit* smooth, cylindric, from four to eight pounds weight, bursting spontaneously.

Beng. and *Hind.* Foont or Tooti.
Teling. Pedda dosray.

Page Carey Ed.

This species I have only found in a cultivated state. In the Tanjore country, and the southern parts of the Carnatic, it is chiefly cultivated during the cold season. The plant is in all respects like that of the common cucumber, except that it is less scabrous, and larger.

MALE FLOWERS axillary, peduncled, crowded. FEMALE FLOWERS solitary, peduncled. *Fruit* very smooth, oblong, generally tapering a little towards the ends with elevation or depression; from twelve to twenty-four inches long, and from three to six in diameter, when ripe bursting slowly into various portions. *Seeds* as in C. *sativus*. III.

The fruit is much eaten both by natives and Europeans; when young they are a good substitute for the common cucumber, and when ripe (after bursting spontaneously,) with the addition of a little sugar they are little inferior to the melon, and reckoned very wholesome. 721

5. C. *utilissimus. Roxb.*

Leaves five-lobed; *lobes* rounded, and toothletted. *Flowers* axillary; the *male* flowers crowded; the *female* solitary. *Fruit* short-oval, smooth, variegated, of the size of a small melon.

Teling. Dosray.
Beng. Kakri.

An annual, a native of the higher cultivated lands, but generally found in a cultivated state; the cold season is the most favourable.

Stems exactly as in C. *sativus*, but not quite so extensive. *Tendrils* simple. *Leaves* broad-cordate, generally more or less five-lobed; *lobes* rounded, toothletted; above pretty smooth, below scabrous, the largest generally about six inches each way. *Floral leaves* of the female flowers sessile, and very small. MALE FLOWERS axillary, peduncled, crowded, but opening in succession. FEMALE FLOWERS axillary, peduncled, solitary, both sorts yellow, about an inch or an inch and a half in diameter. *Fruit* fleshy, generally a very perfect oval; when young downy and clouded with lighter and darker green; when ripe perfectly smooth, variegated with deeper and lighter yellow; from four to six inches long, and from three to four in diameter.

This appears to me to be by far the most useful species of *Cucumis* that I know; when little more than one half grown, they are oblong, and a little downy, in this state they are pickled; when ripe they are about as large as an ostrich's egg, smooth and yellow; when cut they have much the flavor of the melon and will keep good for several months, if carefully III. gathered without being bruised and hung up; they are also in this stage eaten raw and much 722 used in curries, by the natives.

The seeds like those of the other *Cucurbitaceous* fruits contain much farinaceous matter blended with a large portion of mild oil; the natives dry and grind them into a meal, which they employ, as an article of diet; they also express a mild oil from them, which they use in food and to burn in their lamps. Experience as well as analogy prove these seeds to be highly nourishing and well deserving of a more extensive culture than is bestowed on them at present.

The powder of the toasted seeds mixed with sugar is said to be a powerful diuretic, and serviceable in promoting the passage of sand or gravel.

As far as my observation and information goes, this agriculture is chiefly confined to the Guntoor Circar, where these seeds form a considerable branch of commerce; they are mixed with those of *Holcus Sorgum* or some other of the large culmiferous tribe and sown together; these plants run on the surface of the earth, and help to shade them from the sun, so that they mutually help each other.

The fruit I observed above keeps well for several months if carefully gathered and suspended. This circumstance will render them a very excellent article to carry to sea during long voyages.

6. C. *trigonis. R.*

Leaves deeply five-lobed; *lobes* rounded, toothed. *Fruit* oval, obsoletely three-sided, ten-striated, smooth, of the size of a pullet's egg.

Teling. Pam-budinga.

The plant of this species resembles very much the last described one; it is never cultivated, is a native of the higher lands that have been lately cultivated; appears and flowers during the wet and cold seasons.

Stems like those of the last described species. *Tendrils* also simple, the leaves are more III. deeply lobed and rather more scabrous. *Flowers* small, scarcely half an inch in diameter, 723 yellow; situation as in the last mentioned species. The specific difference is in the fruit; this is also oval and smooth, but three-sided with the angles round and the surface streaked with ten light, and ten deep, well defined streaks of deeper and lighter yellow; before maturity these are of a deeper and lighter green colour. It is about the size of a pullet's egg. They are not eaten in these parts.

7. C. *turbinatus. R.*

Leaves palmate, lobes sinuate and bristle-dentate. *Fruit* turbinate, absolutely three-sided, the size of a pullet's egg.

Teling. Nalla budinga.

This species is a native of the same places as the last, but differs from it in the plant being small, having much larger flowers, and pyriform maculated fruit; they are also somewhat triangular, and about the same size, the leaves are also more deeply lobed and bristle-toothed. The fruit of this sort is eaten by the natives.

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8. C. *madraspatanus. Willd.* iv. 615.

Leaves sub-reniform, somewhat lobate-toothed. *Pomes* oval, downy.

Hind. Bun-gumuk.

Teling. Kodee-budinga.

Till I saw Plukenet's figure of C. *madraspatanus*, I considered this to be the plant he meant, but now I hesitate not to say, that his is *Bryonia scabrella* ; however I have continued Linnæus's specific name, although at the same time, I am in doubt whether or not this is the plant he so named. It is much like the two last described species, grows in similar places, is about the same size, and in perfection at the same season, the leaves are more like those of the common cucumber, the fruit about the size of a partridge's egg, oval, downy,

III. 724 maculated, without any tending to be three-sided.

Note. The form of the fruit must be attended to, to distinguish these three last described species.

The fruit of this sort is used in food by the natives and much esteemed, yet they never take the trouble to cultivate the plant.

9. C. *integrifolia. Roxb.*

Leaves sub-rotund, almost destitute of angles, very rugose, posterior lobes rounded, both male and female flowers solitary. *Fruit* globular, smooth.

A native of Bengal, blossoming and ripening its seeds during the rains.

Stems annual, creeping to a great extent, and exceedingly ramous, angular and hairy. *Leaves* sub-rotund, with scarcely any angles, or rather marginal inequalities deeply sinuated behind, with the lobes rounded, very rugose, scabrous above and hairy underneath, from three to six inches each way. MALE FLOWERS solitary, long-peduncled, large, pure white, pubescent. FEMALE FLOWERS also solitary, but shorter peduncled, pure white and pubescent. *Fruit* globular, of the size of a nutmeg, smooth, when ripe of an orange colour.

BRYONIA. Schreb. gen. N. 1480.

Male calyx five-toothed. *Corol* five-parted. *Filaments* three. *Female calyx* and *corol* as in the male. *Berry* few or many-seeded.

1. B. *scabrella. Willd.* iv. 619.

Leaves five-angled, toothed, scabrous, the male flowers petioled, and the female ones sessile. *Berries* globular, many-seeded. *Seeds* smooth.

Hind. Agumuki.

Teling. Puten budinga.

III. Cucumis Madraspatensis fructo minimo. *Pluck.* 123. *t.* 70. *f.* 2.

725 A native of various parts of India, growing on rubbish, and in hedges. Flowering time the wet and cold seasons, and the seed ripens during the latter.

Stem climbing, as thick as a pack-thread, five-grooved, five-angled, hispid. *Tendrils* simple. *Leaves* alternate, the lower ones and those of the larger ramifications have male, or no flowers in their axills, and are petioled ; the superior ones are sessile, and have generally the female flowers, all cordate, angled, toothed, and scabrous ; two inches long, and of the same breadth. MALE FLOWERS axillary, crowded, peduncled, small, yellow. *Anthers* three, one on each filament, oval. FEMALE FLOWERS axillary, from two to four, sub-sessile. *Berry* globular, of the size of a large pea, smooth, striated. *Seeds* several.

2. B. *tenella. Roxb.*

Filiform, creeping. *Leaves* from three to five-angled, denticulate, slightly scabrous. *Flowers* axillary, two male, and one female. *Berries* oblong, smooth.

A native of China, in the Botanic garden it blossoms during the rains, and ripens its seed in the cool season.

Root fibrous, white, rather fleshy, and at least biennial. *Stems* and *branches* numerous, filiform, creeping, pretty smooth. *Leaves* petioled, from three to five-angled, denticulate, slightly scabrous, particularly underneath, about one inch long, and nearly as broad. *Tendrils* simple. *Flowers* axillary, two male, and one female together, each on its proper peduncle, small, pure white ; the male rather large. *Filaments* three, from the bottom of the bell of the calyx or corol, each with a large fleshy lid, on each side of which is a single anther crested behind with a tuft of orange-coloured hairs. *Germ* oblong. *Style* filiform. *Stigma* large, three-lobed. *Berries* oblong, very smooth, when ripe white, of the size of a French bean, many-seeded.

III. 3. B. *glabra. Roxb.*

726 Herbaceous. *Stems* round and smooth. *Leaves* from three to five-lobed ; *lobes* scollop-toothed. *Berries* conical, smooth.

Compare with B. *epigaea. Willd.* iv. 619.

Teling. Naga-donda.

It grows in places similar to the former species, and flowers at the same seasons.

Stems annual, climbing, seldom as thick as a quill, round, smooth, jointed, often bending at the joints in a right angle. *Tendrils* simple. *Leaves* petioled, three-lobed ; lateral lobes often two-parted, and the anterior, from one to three-parted, all are remotely and slightly toothed, somewhat fleshy and a very little scabrous ; about two inches each way. *Petioles* round, smooth. MALE FLOWERS small, yellow, several collected on the apex of a round, smooth, common peduncle ; each half its proper, short pedicel, and bracted at its insertion. FEMALE FLOWERS axillary, solitary, or accompanied with a male raceme, short-peduncled. *Berry* conical, smooth, red, many-seeded.

4. B. *pilosa. Roxb.* Page Carey Ed.

Herbaceous, hairy. *Leaves* round cordate, toothed, downy. *Male flowers* on a short filiform raceme. *Berries* beaked, hairy, from two to six-seeded.

Compared with B. *rostrata. Willd.* iv. 616.

Teling. Cucuma-dunda.

It grows with the former three species, and flowers at the same time.

Stems annual, climbing, five-sided, hairy. *Tendrils* simple. *Leaves* petioled, round, cordate, toothed, downy, from one to two inches each way. MALE FLOWERS axillary, generally two on a long delicate peduncle. FEMALE FLOWERS single, sessile in the same axill. *Berry* sub-conical, of the size of a cherry, red, striated lengthways, hairy. *Seeds* from two to six, black, with a membranaceous border.

Note. These three last described species are not employed for any use that I know of. III. That part of the Hindoo name of the second of them, Naga, would imply that it was employed 727 as a remedy for the bite of the Cobra Capella ; but I could not procure any good authority for its being so.

5. B. *Garcini. Willd.* iv. 623.

Leaves deeply three or five-lobed, toothed, scabrous. *Stipules* and *bractes* ciliate. *Berries* inverse, reniform, two-seeded.

Sicyos Garcini. *Linn. Mant.* 297. *Burm. Ind.* i. *t.* 57. *f.* 3.

Teling. Gudee Muraloo.

This species delights in soil and situation similar to the last mentioned three.

Stems annual, climbing, slender, five-sided, somewhat scabrous. *Tendrils* simple. *Leaves* petioled, three-parted having the lateral lobes, from two to three-parted, all toothed, scabrous, a little hairy, two inches each way. *Petioles* scabrous, nearly as long as the leaves, and thicker than the ramifications from which they issue. *Stipules* axillary, solitary, kidney-formed, waved, fringed with long bristles. *Racemes* axillary or terminal, ornamented with small leaves and bractes like those already described. *Male flowers* above the female ones. *Berries* small, inversely kidney-formed, smooth, red, two-seeded.

6. B. *filiformis. Roxb.*

Stems filiform, five-sided, tendrils simple. *Leaves* cordate, sagittate, dentate, slightly scabrous. *Peduncles* as large as the petioles. *Female flowers* solitary, the male collected. *Berries* oblong, smooth.

A native of the Moluccas, and from thence introduced into the Botanic garden where it blossoms during the cold season.

Stems climbing, very slender, five-sided, smooth. *Tendrils* simple. *Leaves* petioled, cordate-sagittate, with dentate margins, and the posterior lobes large, and nearly square, both sides being highly scabrous, from one to two inches long. *Petioles* angular, a little hairy, III. about as long as the leaves. *Male peduncles* sub-axillary, solitary or with a female peduncle, 728 slender, rather shorter than the petioles, bearing at the apex several sessile, small, yellow flowers. *Calyx* and *corol* as in the genus. *Filaments* three, very short, inserted into the middle of the tube of the calyx. *Anthers* three, simple, obovate, sub-sessile. *Female peduncles* sub-axillary, solitary, or with a male peduncle, and about the same length, one-flowered, slender, smooth. *Calyx, corol* and *pistil* as in the genus. *Berry* oblong, very smooth, slightly marked, while immature, having ten longitudinal stripes; when ripe of an uniform blackish olive colour, nearly an inch long, and about a third thereof in diameter, three-celled, with several small red, flat, ovate seeds in each.

7. B. *laciniosa. Willd.* iv. 624.

Leaves palmate. *Petioles* muricate. *Male flowers* fascicled; the *female* solitary in the same axill. *Berries* spherical, smooth, three-celled. *Seeds* many, with a pulpy aril, callous margins, and gibbous, callous sides.

Nehoemeka. *Rheed. Mal.* viii. *t.* 19.

Hind. Gargoo naroo.

Common in hedges, and among bushes in the warmer parts of India, and in blossom the greatest part of the year.

MONOECIA GYNANDRIA.

ANDRACHNE. Schreb. gen. N. 1483.

Male Calyx five-leaved. *Corol* five-petalled, or none. *Stamina* five, inserted on the abortive style. *Female calyx* five-leaved. *Corol* none. *Germ* superior, three-celled; *cells* two-seeded; *attachment* superior. *Styles* three. *Capsule* berried, three-celled; *cells* from one to two-seeded. *Embryo* inverse, and furnished with a perisperm.

1. A. *trifoliata. Roxb.*

Arboreous. *Leaves* ternate. *Flowers* panicled. III.

A large tree of quick growth ; a native of various parts of India. Flowering time the 729 close of the winter, the seed ripens in May and June.

Trunk erect ; *bark* smooth, of a dark olive colour. *Branches* numerous, forming an extensive; close, shady, ovate head. *Branchlets* frequently drooping much. *Leaves* alternate, petioled, ternate. *Leaflets* petioletted, oblong, with long, sharp, taper points, serrate, smooth on both sides, from four to six inches long. *Petioles* round. *Petiolets* channelled. *Stipules* of the petioles membranaceous, caducous ; those of the petiolets minute, filiform, caducous, leaving a black gland-like speck behind. *Panicles* axillary, or a little above, about as

Page Carey Ed. long as the leaves, those of the male drooping, those of the female when dioecous, sub-erect. MALE FLOWERS sometimes on a separate tree, sometimes on the same, numerous, small, before expansion vertically compressed and five-lobed, of a pale greenish yellow colour. *Calyx* five-leaved; *leaflets* nearly round, concave, expanding. *Corol* none. *Nectary* none. *Filaments* five, opposite, shorter than the leaflets of the calyx, inserted into the abortive style a little below its ten-rayed peltate crown. *Anthers* two. *Germ* none. *Style* short, thick. *Stigma* peltate, ten-rayed. FEMALE FLOWERS whether on the same, or on a different tree, solitary, short-pedicelled, with a lanceolate bracte beneath each. *Calyx* five-leaved. *Corol* none. *Nectary* or *nectarial glands* five, roundish, sub-sessile, within the leaflets of the calyx, much like fertile anthers. *Germ* superior, round, three-celled, with two ovula in each, attached to the upper end of the axis. *Styles* three, recurved, undivided. *Stigma* simple. *Capsule* more like a berry on the outside, of the size of a small cherry, round, smooth, three-celled, with one or two seeds in each. *Embryo* curved, inverse, amply furnished with a perisperm.

CLUYTIA. Schreb. gen. N. 1526.

III. 730 *Male calyx* five-leaved. *Corol* five-petalled. *Stamina* five, inserted into the abortive style. *Female calyx* and *Corol* as in the male. *Styles* three, two-cleft. *Capsule* trilocular. *Seed* solitary.

1. C. *semperflorens. R.*

Shrubby, erect. *Leaves* sub-lanceolar, acute. *Male flowers* in axillary, and lateral glomerules; the *female* ones few and apetalous.

A small, erect, ramous shrub; a native of Silhet, where it is in flower and seed the whole year round.

Stem erect, short, soon dividing into a few erect, and spreading branchlets. *Bark* of the old ligneous parts dark brown, and scabrous; that of the tender shoots, densely clothed with short hairs. *Leaves* alternate, short-petioled, sub-lanceolar, tapering most toward the base and there somewhat cordate, with a very few hairs on the rib and veins, all the rest smooth, about six inches long, by two broad. *Stipules* small and subulate. *Flowers* short-pedicelled, forming crowded, roundish glomerules over the leafless branches, chiefly axillary, the male ones very numerous and purple, the female ones large, few and green. *Male calyx*, five unequal, spreading, small oval leaflets. *Petals* five, round, obovate, spreading, of a deep purple. *Nectary*, five glands alternate with the insertion of the petals. *Filaments* single, columnar. *Anthers* six, placed in a stellate form round the apex of the column, and open on the under side. *Female calyx* five-leaved. *Corol* none. *Nectary*, a pentagonal ring round the base of the germ. *Germ* superior, roundish, hairy, three-celled, with one ovulum in each, attached to the axis above its middle. *Styles* three, bifid, recurved. *Capsule* the size of a large pea, of an olive colour, villous, tricoccous. *Seeds perisperm* and *embryo*, as in the order.

2. C. *oblongifolia. R.*

Arboreous. *Leaves* alternate, short-petioled, oblong, acute, smooth, glaucous underneath. III. 731 *Flowers* sessile, crowded, axillary. *Petals* obcordate, tridentate.

A middling sized tree, a native of the forests of Silhet, where it is called Dookesa. It furnishes the natives with hard durable wood, fit for various economical purposes. Flowering time the end of the hot season; the seed ripens in August and September.

Twigs straight, slender and smooth. *Leaves* alternate, bifarious, short-petioled, oblong, entire, sub-acuminate, having the upper surface polished, and the under one glaucous, from four to six inches long, by two and a half broad. *Flowers* numerous, sessile, small, crowded into little, round, axillary heads, or in little lateral and terminal spikes. *Bractes* numerous amongst the flowers, small and hairy. *Calyx* in both male and female five-parted, permanent; *segments*, tapering and smooth. *Petals* in both five, generally smaller than the calyx, obcordate, three-toothed. *Stamens* in the male flowers five, inserted on a column, as in the genus. In the female ones none. *Germ* superior, the base embraced by a five-toothed cup. *Styles* and *stigmas* as in the genus. *Capsule* short-pedicelled above the permanent calyx, of the size of a cherry, smooth, three-lobed, three-celled, six-valved. *Seed* solitary, with inverted embryo, as in the other *Euphorbiæ*.

3. C. *diversifolia. R.*

Leaves sub-sessile, from obovate and obtuse to broad-lanceolate and acute, smooth and entire. *Stipules* ensiform. *Flowers* axillary, sessile. *Petals* obovate. *Stigmas* three-cleft.

A native of the Malay Islands.

Branchlets downy. *Leaves* bifarious, short-petioled, from oblong and obtuse, to broad-lanceolate and acute, all entire and smooth on both sides, from four to five inches long. *Stipules* ensiform, downy. *Flowers* axillary, male and female mixed, both perfectly sessile, and III. 732 scarcely longer than the stipules. *Male calyx* of five acute, erect, smooth segments. *Petals* five, roundish, obovate, inserted by short claws on the outer edge of the nectary. *Nectary* saucer-shaped. *Column* with five expanding filaments, inserted above its middle, above their insertion three-cleft. *Anthers* incumbent. *Female calyx*, *corol* and *nectary* as in the male. *Germ* hairy. *Styles* three. *Stigmas* trifid.

4. C. *collina. Willd.* iv. 883. *Roxb. Corom. pl.* ii. *N.* 169.

Leaves sub-sessile, oval, smooth, entire. *Flowers* axillary. *Leaflets* of the calyx lanceolate. *Petals* minute. *Capsules* tricoccous.

Tam. Woodacha-marum.

Teling. Kadishen.

A small tree, a native of the hilly parts of the Circars. It flowers during the hot season.

The seed ripens in December and January.

Page Carey Ed.

Leaves alternate, short-petioled, bifarious, the smaller ones orbicular, the larger obovate, entire, smooth, shining, size various. *Stipules* small, acute, hairy, falling. *Flowers* short-peduncled, middle size, green, sometimes the male and female ones are mixed in the axills of the same leaves; sometimes the male flowers are collected by themselves in little bundles in the axills, and the female ones solitary in distinct axills, and sometimes again it happens that they occupy different trees. *Bractes* several, very minute, surrounding the insertion of the peduncles. *Male calyx* split to very near the base, into five segments; *divisions* tapering, withering. *Petals* five, very minute, lanceolate. *Nectary* saucer-formed. *Stamens*, in the centre of the nectary there is a cylindric column from which, near the apex, there issue five ascending filaments. *Anthers* oblong, erect. *Pistillum*, no other than the fore-mentioned column. *Female calyx* and *corol* as in the male. *Nectary* cup-formed, closely embracing half the germ; margin slightly notched. *Germ* superior, ovate. *Styles* three, each two-cleft. *Stigmas* simple. *Capsule* somewhat three-lobed, smooth, very hard, three-celled, six-valved, the size of a nutmeg. *Seeds*, only one in each cell comes to maturity, though when young there are the rudiments of two, round, smooth, of the size of a pea.

III. 733

The bark, or outer crust of the capsule is reported to be exceedingly poisonous. The wood of the tree is of a reddish colour, exceedingly hard, and durable.

5. C. *patula. Willd.* iv. 884. *R. Corom. pl.* ii. *N.* 170.

Leaves ovate-oblong, pointed, smooth, entire. *Flowers* axillary, or on axillary spikes. *Petals* round, crenulate, clawed. *Capsules* tricoccous.

A much larger tree than *collina*, a native of moist valleys amongst the Circar mountains. It flowers during the hot season.

Trunk straight, from fifteen to twenty feet to the branches. *Bark* pretty smooth, dark-coloured, thin and hard. *Branches* very numerous, spreading horizontally, and forming a large shady head. *Branchlets* bifarious, twiggy. *Leaves* alternate, short-petioled, bifarious, oblong, attenuated to a long, slender point, entire, smooth, shining, about three inches long, by one and a half broad. *Stipules* small. *Flowers* nearly sessile, male and female collected in little bundles in the axills, sometimes on small axillary, interrupted spikes. *Bractes* small, numerous, chaffy, surrounding the insertions of the flowers. *Male calyx* as in the former species. *Petals* five, orbicular, crenulate, many times smaller than the calyx, inserted by claws. *Nectary* saucer-shaped. *Stamens* as in the former species. *Female calyx* and *corol* as in the male. *Nectary* cup-formed, embracing only about a third of the germ. *Germ* superior, ovate, hairy. *Styles* three, two-cleft. *Stigmas* small. *Capsule* the size of a small cherry, three-celled, three-valved. *Seed* solitary.

The wood of this tree is of the colour of dried rose leaves, also hard and durable.

BRIEDELIA. Willd.

III. 734

Male calyx five-parted. *Corol* five-petalled, inserted on the calyx. *Stamina* five, inserted on the abortive style. *Female calyx* and *corol* as in the male. *Germ* superior, two-celled; *cells* two-seeded; *attachment* superior. *Styles* two, bifid. *Berry*, or *drupe* two-seeded. *Embryo* inverse and furnished with a perisperm.

1. B. *crenulata. Roxb.*

Leaves linear, oblong, scarcely crenulate, tomentose underneath. *Flowers* axillary, crowded, sessile.

A large timber tree, a native of the mountainous countries near the mouth of the river Megna, from thence sent by Stephen Harris, Esq. to the Botanic garden, where after twelve years, it blossomed in May and the seed ripened in October. This will belong to that division of my *Cluytias*, which Willdenow, in his edition of the *Species Plantarum* of *Linnæus. vol.* iv. *p.* 978, has very properly made a distinct genus, under the name of *Briedelia*. I do not, however, remember to have found any of the flowers hermaphrodite, in any of the species.

Trunk tolerably straight, in trees twelve or thirteen years old, four feet above the earth, from two to three feet in circumference, covered with deeply cracked, ash-coloured bark. *Branches* expanding; *young shoots* round and villous, while the trees are young a few long sharp spines are found thinly scattered over the trunk and large branches. *Leaves* alternate, bifarious, short-petioled, linear-oblong, or elliptic, obtuse, slightly crenulate, of a firm texture, smooth above, downy underneath, with numerous, simple and parallel veins, from two to four inches long, and about half that in breadth. *Stipules* ensiform, caducous. *Thorns*, on our young trees, a few long straight, simple ones are found on the trunk and large branches. *Flowers* axillary, sessile, crowded, small, pale yellow, the male ones on one tree, and the female ones on another. *Male calyx* five-leaved, or to the base five-cleft; *leaflets* ovate, acute. *Petals* oval, notched, long-clawed. *Nectary* acetabuliform. *Filaments* inserted on the column, below its bidentate apex. *Female calyx* and *exterior nectary* as in the male. *Petals* lanceolar; the *inner nectary* pitcher-shaped, enveloping the germ; its contracted mouth five-toothed. *Germ* ovate, two-celled, with two ovula in each, attached to the top of the partition. *Styles* two, short, two-cleft. *Stigmas* simple. *Drupe* superior, round, of the size of a large pea, succulent, when ripe of a shining black, two-celled. *Nuts* hemispherical, rugose, the exterior or convex side, one-celled. *Seed* conform to the nut. *Integument* single, thin. *Perisperm* conform to the seed, rather hard. *Embryo* inverse. *Cotyledons* retuse. *Radicle* oblong, superior.

III. 735

2. B. *montana. Willd.* iv. *p.* 978.

Leaves long obovate, entire, smooth. *Flowers* axillary, sessile. *Petals* roundish, clawed.

Page Carey Ed.

Berry two-celled.

Cluytia *montana. Roxb. Corom. pl.* ii. *N.* 171.

Teling. Pantenga.

On the interior mountains it grows to be a tree, on the lower lands it does not grow so large.

Trunk erect, short and thick. *Branches* numerous, spreading. *Branchlets* bifarious, twiggy. *Leaves* alternate, short-petioled, bifarious, obovate, or wedge-formed, smooth, entire, from two to three inches long, broad in proportion. *Stipules* small, acute, withering. *Flowers* small, green, axillary, crowded, sessile, the male and female mixed. *Bractes* minute, numerous, withering. *Male Flowers* exactly as in *Cluytia patula. Female calyx, corol* and *nectary* as in *Cluytia patula. Germ* superior, ovate, two-celled, with two ovula in each, attached to the top of the partition. *Styles* two, two-cleft. *Stigmas* simple. *Berry* globular, succulent, of the size of a pea. *Seeds* two, oval, one side flat, the other convex.

The wood of this tree like the two former is very hard and of a reddish colour.

III. 736

3. B. *spinosa. Willd.* iv. *p.* 979.

Arboreous. *Leaves* oblong, entire, smooth. *Flowers* spiked. *Petals* round, curled, clawed. *Nectary* in the male flowers double. *Berries* two-sided.

Cluytia spinosa. Roxb. Corom. pl. ii. *N.* 172.

Teling. Kora man.

This is a tree of considerable size, a native of the Circar mountains, as well as of various parts of Bengal, where it blossoms during the rainy season, chiefly in July, and the seeds ripen in December.

Trunk straight. *Bark* scabrous. *Branches* disposed as in the last. *Thorns* a few over the larger branches, large and strong. *Leaves* also disposed in the same manner, oblong, pointed, entire, firm, smooth, with many parallel protuberant veins running from the centre to the circumference, about five inches long, and two and a half broad. *Spikes* axillary or terminal, glomerate ; flowers collected in bundles leaving the interstices naked. *Flowers* small, of a greenish yellow, male and female mixed. *Male calyx* and *corol* as in the two last species. *Nectary* double, the exterior saucer-shaped and the interior cup-shaped, sitting on the exterior, or that which is saucer-shaped, and divided to near the base, into five segments ; divisions narrowing towards the point, with the extremities three-toothed. *Stamens ; filaments* five, inserted into an erect column. *Female calyx* and *corol* as in the male. *Nectary* gibbous, surrounding the germ entirely, and leaving only a small opening for the styles to pass, and there five-toothed. *Germ* ovate. *Styles* two, two-cleft. *Stigmas* simple. *Berry* globular, of the size of a pea, succulent, black. *Seeds* two.

The bark is a strong astringent. The wood dark coloured, hard and durable. Cattle eat the leaves greedily ; they are said to destroy worms in their bowels.

4. B. *scandens. Willd.* iv. *p.* 979.

Shrubby, scandent. *Leaves* oblong, downy underneath. *Petals* roundish, crenulate, clawed.

III. 737

Cluytia scandens. Roxb. Corom. pl. ii. *N.* 173.

Scherunam cottam. *Rheed. Mal.* ii. *t.* 16.

Teling. Doonkiboora.

A large, woody, climbing species, common on banks of rivers and water courses in the Circars. It flowers in November and December.

Trunk scarcely any ; *branches* long, climbing, with their extremities flower-bearing and pendulous. *Bark* ash-coloured. *Leaves* alternate, short-petioled, bifarious, oval, entire, downy underneath, various in size. *Stipules* cuneiform, as long as the petioles. *Flowers* small, of a yellowish green, either axillary, crowded, and sessile, or interrupted, leafy, terminal, or axillary, generally male on one branch, and female on another. *Male flowers* as in *Cluytia patula* except that in this species, the petals are not at their extremities. *Female calyx* and *corol* as in the male. *Nectary*, double as in *Briedelia spinosa*, and in every respect the same. *Germ* superior, ovate, hid in the inner nectary, two-celled, with two ovula in each, attached to the middle of the partition. *Styles* two, two-cleft. *Stigmas* simple. *Berry* oblong, juicy, smooth, of the size of a large field bean, when ripe it is of a rusty black colour. *Seeds* two. *Embryo* inverse and furnished with a perisperm.

5. B. *lanceæfolia. R.*

Monoecous. *Leaves* broad-lanceolar, obtuse, smooth, glaucous underneath. *Flowers* axillary, crowded, sessile. *Petals* roundish, dentate. *Berries* globular.

A tree of considerable size and quick growth, a native of Bengal. In the Botanic garden, they have attained to the height of twenty feet in four years, thick and ramous in proportion. They blossom at various times of the year, but chiefly about the close of the rains, and the small, round, dark purple berries ripen in the cool season.

III. 738

CLASS XXII.

DIOECIA MONANDRIA.

PANDANUS.

Male spadix compound ; *spathes* alternate, ensiform. *Proper perianth* none. *Corol* none.

Anthers inserted on the ramification of the spadix. *Female spadix* strobiliform; *spathes* in three fascicles. *Perianth proper*, none. *Corol* none. *Germs* from one to many-celled; *cells* seeded; *attachment* inferior. *Fruit* compound. Page Carey Ed.

1. P. *odoratissimus. Willd.* iv. 645.

Ramifications of the male spadix compound. ***Drupes*** of the compound fruit turbinate, each containing a many-celled nut.

Sans. Ketuka.

Hind. Keura.

Beng. Kea.

Mellore, or Nicobar bread fruit. ***Asiat. Res.*** iii. 161.

Kaida. *Rheed. Mal.* ii. *t.* 1. 5.

P. *odoratissimus. R. Corom. pl. N.* 94, 95, 96.

P. verus. *Rumph. Amb.* iv. *t.* 74.

Anthrodactylis spinosa. *Forst. gen. N.* 75.

Keyro. *Forsk. Ægypt.* 172.

Mugalik is the Telinga name of the male plant, and Gozdoogoo that of the female. Kaldera is the name they are known by amongst Europeans on the coast of Coromandel. It is a native of all the warmer parts of Asia, all soils and situations seem to suit it equally well. It flowers chiefly during the rainy season.

Trunk, now and then a plant may be found with a single, pretty erect one, from ten to twelve feet in height, and a ramous round head; but this is seldom, for it is generally in form of a very large, ramous, spreading bush; from the stems, or larger branches, long, fusiform, obtuse-pointed roots issue, descending till they come to the ground which they enter and then divide. The substance of the most solid wood is something like that of a cabbage stem, which by age acquires a woody hardness on the outside. *Leaves* confluent, stem-clasping, closely imbricated in three spiral rows, round the extremities of the branches, drooping, from three to five feet long, tapering to a very long, fine, triangular point, very smooth, and glossy, margins and back armed with very fine sharp spines, all those on the margins point forwards, those of the back point sometimes one way and sometimes the other. *Male inflorescence* terminal, a large pendulous, compound, leafy panicle, the leaves thereof are white, linear-oblong, pointed and concave, in the axill of each there is a single thyrse composed of simple, small racemes of long, pointed, depending anthers, which are not sessile, but raised from the rachis of these partial racemes by tapering filaments, hence I call these parts of the thyrse racemes and not spikelets. *Female flowers* on a different plant, terminal, and solitary, having no other calyx, or corol than the termination of the three rows of leaves forming three imbricated fascicles of white floral leaves or involucres, like those of the male racemes, only here they stand at equal distances round the base of the young fruit. *Germs* numerous, collected into firm, wedge-shaped, angular bundles, of from six to ten; these form the compound germs of the future fruit, and are closely impacted round the receptacle. *Style* none. *Stigmas* single, on each undivided germ, oval, grooved lengthways, yellow, affixed to the outside of a two-lipped umbilicus, on the apex of the germ. *Pericarp; fruit* compound, oval, from six to eight inches in diameter, and from six to ten long, weighing from four to eight pounds, rough, of a rich orange colour, composed of numerous, wedge-shaped, angular drupes, when ripe their large or exterior ends are detached from one another, and covered with a firm, deeper or orange-coloured skin; apices flat, consisting of as many angular, somewhat convex tubercles as there are cells in the drupe, each crowned with the withered stigma, internally the exterior half of these drupes next the apex, consists of dry spongy cavities, their lower part next the core on common receptacle is yellow, consisting of a rich-looking, yellow pulp intermixed with strong fibres; here the nut is lodged. *Nut* of each drupe compound, turbinate, exceedingly hard, angular, containing as many cells as there are divisions in the apex of the drupe, each cell is perforated above and below. *Seeds* single, oblong, smooth, adhering lengthways to a small fascicle of strong white fibres, which pass through the perforations of the cell. By far the greatest number of the cells are barren. III. 739 III. 740

Note. This plant is much employed to make hedges, for which it answers well, but requires too much room. It grows readily from branches which renders it rare to find the full grown, ripe fruit. The male is by far the most common, a circumstance merely accidental, for I have seen some old extensive hedges entirely female, which must be owing to there having been originally a female plant or plants nearest to these places. It is the tender white leaves of the flowers, chiefly those of the male, that yield that most delightful fragrance for which they are so universally and deservedly esteemed; for of all the perfumes in the world it must be the richest and most powerful.

The lower yellow pulpy part of the drupes is sometimes eaten by the natives during times of scarcity and famine; the tender white base of the leaves is also eaten raw or boiled during the same melancholy periods. The fusiform roots already mentioned are composed of tough fibres, which basket-makers split and use to tie their work with, they are also so soft and spongy as to serve the natives for corks. The leaves are composed of longitudinal, tough, useful fibres like those of the Pine-apple. I have never known this plant cultivated with any other view than for fences, nor do I yet know any other species, or even variety of this genus. III. 741

The drawing of the Mellore, or bread fruit of the Nicobar Islands in the third volume of the *Asiatic Researches*, was taken from the ripe fruit brought from those Islands by Colonel Kyd. From this drawing and description there is every reason to think it is the fruit of the female plant of *Pandanus odoratissimus*. The size, from thirty-five to forty feet in height, to which it rises on those Islands, is much greater than I ever saw it on the Coromandel coast,

Page Carey Ed. or in Orissa, or Bengal, which, however, is not a sufficient reason to make it a different species.

Extract of a letter from Colonel Hardwicke, dated Mauritius, November 1811. This plant is of extensive use in most parts of the Island, for its leaves, which are employed for the purpose of package bags for the transportation of coffee, sugar, and grain from one place to another, and for exportation. Hedge rows, or avenues are formed of it round plantations, or along the sides of the many roads which intersect them; and the leaves, as fast as they attain maturity are cut till the tree arrives at its full growth, when the production of new leaves being slower, and less useful, younger plants are resorted to, to supply the wants of the planter. The preparation of the leaves for working into matting is simple and short. As soon as gathered, the spines on their edges and dorsal nerve are stripped off, and the leaf divided into slips of the breadth proper for the use they are required for; this operation is performed with the blade of a common straight knife, they are then laid in the sun for a few hours to dry; when required for working into mats the slips are passed under the blade of a knife applied with a moderate pressure to remove all asperities on their surface, which gives them a polish and makes them plain and more convenient to the hands. One negro employed
III. in the foregoing preparation, will supply slips fast enough to keep eight others at work; and
742 each negro can finish four, and sometimes five bags in the course of the day. Thus the value of each bag may be computed by the cost, or worth of the labour of nine negroes for one day. Every proprietor of slaves can obtain, by letting them out to daily labour, six Spanish Dollars, or twelve Sicca Rupees per month; the value therefore of the labour of one man for a day may be rated at six annas and one third, thus taking the lowest number made, viz. thirty-six, the cost of each bag will be about one anna and a half. This to me appears a cheaper material than the common gunny bag of Bengal used in the exportation of rice and other grain in Calcutta; it seems also better calculated to repel wet and resist the common injuries of transportation from one place to another. No difficulty would attend the cultivation of this plant in Bengal, where one, or more species of this genus is indigenous. This tree attains here the height of about fifteen feet, the stem at half that height branching into several suberect arms terminated by the thick foliage. It flowers in the month of May; the fruit of the kind I here notice is when full grown about five inches in diameter, the seed large, turbinate with an angular apex.

2. P. *foetidus. Roxb.*

Partial racemes, or *thyrses* of the male flower simple. *Germs* distinct. *Drupes* spinous pointed, with one-celled nuts.

Hind. Keur-kanta.

Beng. Kea-kanta.

Found in Bengal, growing wild in uncultivated spots near Calcutta. Flowering time the cold season; the fruit ripens during the hot months of May and June.

I never saw a plant with any thing like a stem, but always in the form of a thick impenetrable bush, of from five to six feet high. *Leaves* as in P. *odoratissimus*, but smaller. *Male*
III. *inflorescence* as in P. *odoratissimus*, only here the secondary racemes, or thyrses, are simple,
743 being only a thick, tapering, fleshy receptacle, of about an inch in length, to which the anthers are affixed. *Filaments* very short, with a thick conical base. *Anthers* long, linear, generally waved, with a polliniferous groove on each side. *Female*, the whole of the aggregate female flower as in P. *odoratissimus*. *Germs* most numerous, single and distinct, not collected into fascicles as in the former species, the lower half angular; the upper half tapering into a very sharp, subulate point, on the under side of which there is a lighter coloured, linear, glandular, furrowed elevation, which I take to be the stigma; however immediately below this elevated groove there is a smooth oblong pit or hollow, in the lower part of which is a single cell, with ten ovula, attached to one side of the bottom of the cell. *Fruit* ovula, three-sided, echinated with the most acute prickly points of the drupes, of the size of a small pine apple, when ripe red. *Drupes* wedge-shaped, angular, single, but firmly and closely connected by a pulpy gluten, crowned with the remaining stigma, which is now a sharp thorn. *Nut* conformed to the shape of the drupe, longitudinally fibrous, not very hard, two-celled. *Seed* solitary, in the lower cell, or part of the nut, a septum separating the seed from an upper cell of the nut, which is larger, and replete with soft white pith only.

Note. The smell of both male and female flowers is highly offensive, being almost like that of the flowers of *Sterculia foetida*. So far as I know, it is only employed for hedges.

3. P. *amaryllifolius. R.*

Diffuse. *Leaves* linear, tending to be three-nerved, apices rather broad, somewhat spinous-serrulate.

This species came from Amboyna. It has now been fourteen years in the Botanic garden and is by far the smallest I have yet known. It has less of the general habit of the genus, than any other I know, but is furnished abundantly with the characteristic fusiform roots, which issue from the stems and larger branches, and enter the ground, which leaves no doubt
III. with me of its being a *Pandanus*.
744 4. P. *furcatus. R.*

Drupes of the oblong compound fruit cuneate, crowned with an incurved, polished, sharp, forked spine, nuts one-celled.

Kaida Tsjerria. *Rheed. Mal.* ii. *t.* 8.

A native of Pegu, Chittagong, Malabar, &c.

5. P. *inermis. R.*

Diffuse. *Leaves* ensiform, channelled, unarmed, and polished.

Page Carey Ed.

From Amboyna this pretty small species has been introduced into the Botanic garden, where it grows luxuriantly, spreading and leaning over a surface of several feet, and sending forth the usual fusiform roots which enter the soil, as in the other species. The leaves are from two to three feet long, highly polished, and in all our young plants without the smallest sign of a prickle, apices long and slender, triangularly subulate.

CYCAS.

Male ament strobile-shaped; *scales* thereof covered on the under side with distinct, sessile, one-celled, two-valved anthers. *Female spadix* with a few solitary, bifarious, alternate, sessile, naked, one-celled germs on the margins, with a single ovulum, attached to the bottom of the cell. *Style* single. *Drupe* with a woody, one-celled nut. *Embryo* inverse, and amply furnished with perisperm and vitellus.

1. C. *circinalis. Willd.* iv. 844.

Leaves pinnate, with long armed petioles. *Leaflets* from fifty to sixty pair, sub-alternate, rather remote, flat, linear-lanceolate, sickle-shaped.

C. *inermis. Lour. Cochin Ch.* 776.

Olus Clappoides. *Rumph. Amb.* i. *t.* 22. the female, and *t.* 23. the male. III. 745

This beautiful, small palm has of late years been introduced from Amboyna into the Company's Botanic garden, where it thrives freely; blossoms in May, and ripens its seed in December and January.

The *trunk* of our young trees, now ten or twelve years in this garden, and some years old when they arrived, is from two to five feet high, and from eighteen to twenty-four inches in circumference, very rough with the swelled scars of the fallen leaves. *Leaves* spreading round the crown of the plant, numerous, viz. sixty or seventy, pinnate, of a smooth, shining, deep green in every part, from three to six feet long. *Leaflets* generally from fifty to sixty on each side, consequently rather remote, in some parts opposite, in others alternate, of a linear-lanceolate, sickle form, acute, almost flat, very smooth and entire, from four to ten inches long, and about half an inch broad. *Petioles* nearly round, smooth, from twelve to twenty-four inches of the base destitute of leaflets, and there generally armed with a row of short sharp spines on each side. *Stipules*, so I call the numerous, pointed, villous, imbricated scales, which are mixed amongst the swelled leaves of the petioles, and closely embrace the peduncle of the strobile. *Male strobile* elevated on a short, thick, firm peduncle, from the crown of the plant, ovate oblong, being at first about nine or ten inches long, but lengthening to nearly double that extent, and continuing throughout about five inches in diameter, imbricated with numerous, diverging scales. After continuing in vigour for nearly two months, its peduncle is forced to one side, to give room for the annual tuft of foliage, which then begins to appear from the centre of the crown of the plant. *Scales* wedge-shaped, obliquely-truncated, and there clothed with much fulvous down. In two of the three male plants now in blossom, a large, erect, subulate point rises from the exterior upper angle of each of the scales; when the strobile first appears they are closely pressed together like the germs III. 746 in the pine-apple, but as it lengthens by age they become detached from each other, and free on all sides. *Corol* none. *Filaments* none. *Anthers* perfectly distinct, numerous, entirely covering the under surface of the scales of the strobile, one-celled, two-valved, opening round the apex for the discharge of the pollen. *Pistil* nothing like one to be found.

Female. In May 1804 a female plant blossomed at the same time the above-mentioned three male trees were in flower. The female tree is rather higher and more robust than the largest of the males, and its inflorescence differs but little from that of *revoluta*, viz. a strobiliform cone crowning the stem surrounded with a circle of leaves exactly like those of the male. This strobile is composed of many exterior, barren, villous, cuspidate scales called stipules in the male, immediately within are the downy, compressed, clavate, spatulate, two-edged spadices; on the sides, about the middle of each, the naked, round, smooth, one-celled, one-sided germs are immersed, generally two on each side, crowned with a minute style, and a perforated, callous, marginal stigma. Beyond the germs the spadix becomes incurved, and of a dilated, rhomb shape, with the exterior margins cut into several subulate, straight segments, the middle one being much longer, larger, and more villous than the rest. *Drupe* oval, of the size of a small pullet's egg, somewhat flattened, smooth till they become wrinkled by drying; when ripe yellow, one-celled. *Nut* conform to the drupe, ligneous, one-celled, lined on the inside with much brown, spongy matter, particularly about the base.

2. C. *revoluta. Willd.* iv. 844.

Leaves pinnate, with short, armed petioles; *leaflets* approximate, from one to two hundred pairs, linear, with a spinous point, and revolute margins.

C. *revoluta. Smith* in *Trans. of Linn. Soc.* vi. 312. *t.* 29, 30; excellent for the female plant.

The female of this charming species, is very common in gardens about Calcutta, where it III. 747 grows in about the space of thirty years, to the height of ten, or twelve feet; I mean the trunk, every one of which produces offsets in abundance, by which the plant is readily multiplied. But I see no reason to think it can ever be made a useful article of diet. I have never found the male tree.

3. C. *sphaerica. Roxb.*

Leaves pinnate, sides of the petioles armed with a short spine; *leaflets* from eighty to one hundred pair, subalternate, linear, spinous-pointed. *Scales* of the male strobile with long, curved, subulate points. *Drupes* spherical.

Page Carey Ed.

This additional, charming species of *Cycas* was with C. *circinalis*, introduced into the Botanic garden from the Moluccas in 1798-9. In 1806 and the following year several of both male and female plants, blossomed in the month of May. The female of one of those ripened its seeds in January and February, and now, September, those seeds are beginning to vegetate, after having been in the ground about six months. The plants of this species differ in habit but little from *circinalis*; I will therefore only note wherein they differ from each other.

Trunk of both the male and female trees, are hitherto, in this species from thirty-four to fifty-four inches in circumference; it is therefore thicker than *circinalis*, in other respects they are alike. *Leaves*, in this species they are smaller, the petioles longer and more armed, and the leaflets more numerous, viz. from eighty to one hundred, sub-alternate pairs. In *circinalis* they are from fifty to sixty, narrower, and straighter. MALE. In this the strobile, or cone, has the same appearance of a pine-apple, as it has also in the other, but the scales taper from the middle, into very long, incurved, subulate points; whereas in *circinalis* they are almost truncated, with a point more or less long, rising nearly at right angles, from the exterior upper angle. *Anthers* the same in both. About the time the cone, or flower, begins to

III. 748

decay, it is, as in *circinalis* forced to one side by the annual tuft of foliage bursting from the crown of the plant. FEMALE. The spadices are numerous, and with generally three pistils on each side, beyond these they rise in a curve, and immediately expand into an ovate-triangular shape, with long, subulate points, and the whole margins deeply and acutely dentate; every part, except the pistil, is clothed with a thick coat of ferruginous down, which is easily rubbed off. In C. *circinalis* these form a large globular crown in the centre of the last year's foliage, and are surrounded with numerous, barren, cuspidate scales, or bractes. *Germs* solitary, round, partly immersed in the edge of the spadix, one-celled, ovula solitary, amply attached to the bottom of the cell. *Style* short, straight. *Stigma* simple, perforated. *Drupes* nearly round, a little compressed, smooth, about the size of a pigeon's egg, tipped with the permanent stigma, when ripe of a dull orange colour. *Pulp* somewhat mealy, sweet, yellow, but the smell is uncommonly disagreeable. *Nut* solitary, conform to the drupes, ligneous, a little pointed under the stigma, with a small elevation running from thence to the base on each side, which marks the place where it bursts, when the seed begins to vegetate, consequently it is two-valved. *Seed* single, of the size and shape of the cavity of the nut which it completely fills. *Integuments* three, the exterior one deep brown, thick, and firm, adhering to the inside of the shell, particularly at the bottom, the middle one thin, of a light brown, membranaceous, and the inner one a very thin white membrane. *Perisperm* conform to the seed, of a pale yellowish white, fleshy; in its apex, under the style, is a transversely oval pit, the bottom thereof marked with five or six brown dots, corresponding with as many oblong cavities immediately under them, which penetrate, in unimpregnated seeds about one-tenth their diameter, these are alike in shape and size, but in such as have been impregnated, one of these cells penetrates more than half way down, through its centre, and contains a wedge-shaped

III. 749

body, which I call the *vitellus*, suspended, or attached to the mouth of the cell, by a long, white, folded, umbilical cord. A vertical section of this body exposes what I call the true *embryo* lodged a little above its middle, and composed of two unequal lobes, resembling cotyledons pointing to the base of the vitellus; from the upper pointed end of this bilobate body the radicle issues, when vegetation commences, passing out through the mouth of the cell, and the apex of the nut now open; from the middle of the upper side of the radicle bursts forth, in due time, the *plumula*, in form of a small scale, and from its centre other scales continue to spring; the fourth, or fifth, begins to take the form of the pinnate leaf of the full-grown plant.

From the fresh wounded parts of all the three species of *Cycas* known to me, viz. *circinalis*, *revoluta* and this, there is discharged a quantity of clear, insipid mucilage, which soon hardens into firm, transparent gum, like *tragacanth*, but clearer; my experience however, does not lead me to think that any one of the three yields sago, or even a substitute for it. I dare not venture to quote *Todda panna* of *Rheede's Malabaricus*, iii. *t.* 13—21, for this because it has already been quoted by *Linnæus*, &c. for C. *circinalis*, yet I think *Rheedes* figures and description, agree better with this plant than with what I have already described, and figured under that name. For more information, consult *Rumph's Herbarium Amboinense*, i. *p.* 86—92, and the figures there quoted.

NAJAS.

Male calyx cylindric, bifid. *Corol* four-cleft. *Filaments* none. *Female calyx* none. *Corol* none. *Pistil* none. *Capsule* one-celled.

N. dichotoma. R.

Dichotomous. *Leaves* tern, filiform. *Seed* solitary, oval, smooth. It grows in deep pools of sweet water in Bengal.

III. 750

DIOECIA DIANDRIA.

VALLISNERIA. Schreb. gen. N. 1491.

Male spathe entire, or two-parted. *Spadix* simple. *Corol* three-petalled, or three-parted. *Female spathe* as in the male, one-flowered. *Perianth* three-parted. *Corol* three-petalled. *Styles* three or three-parted. *Capsule* one-celled, many-seeded.

1. V. *spiraloides. R.*

Stemless. *Leaves* radical ensiform, serrulate. *Female* on a spiral scape, with a three-toothed spathe ; no corol, nor nectary. Page Carey Ed.

A native of Coromandel.

2. V. *alternifolia. R.*

Ramous. *Leaves* linear, alternate, and opposite at the origin of the branches.

Hind. Ganj.

Beng. Rusna-jhanj.

Found in ponds of fresh water near Calcutta, in high perfection during the latter part of the rainy season.

Root stole-bearing, affixed in the ground, fibrous. *Stems* filiform, ascending through the water, and of various lengths, but sufficient, when the inundations are not too rapid, to raise the alternate ramifications even with the surface of the water. *Leaves* alternate, except at the ramifications, and there generally opposite ; those of the stem remote ; of the flower bearing branches approximate ; stem-clasping, sword-shaped, serrate, from two to four inches long. So far the male and female plants agree. MALE. *Calyx common, spathes* axillary, paired, sessile, composed of two valves parting when the corollets are ready to be disengaged. *Common spadix* as in the genus, surrounded with innumerable pedicelled corollets. *Corol* five-petalled, unequal, completely reflexed. *Filaments* two, clubbed. FEMALE. *Flowers* axillary, sessile, paired. *Spathe* as in the genus. *Perianth* (or *corol*) three-leaved, spreading, orbicular, concave and elevated on a most slender pedicel. *Corol* no other than the last mentioned. *Germ* oblong, tapering in the above mentioned slender pedicel or style ; *stigma* six-leaved ; *leaflets* revolute, appearing like the corol sitting close to the calyx. *Capsule* as in the genus. III. 751

Note. The small corollets when separated from the spadix, swim upon the tips of the reflected petals, over the surface of the water, till entangled by the large corol-like stigmas of the female flowers.

3. V. *verticellata. R.*

Ramous. *Leaves* verticelled. *Male spathe* one-flowered.

Hottonia *serrata. Willd.* i. 329.

Serpicula *verticellata. Suppl. p.* 416. *R. Corom. pl.* ii. *No.* 164.

Teling. Poo natsoo.

Grows in clear, standing, sweet water. Flowers during the cold season, and consists of simple, filiform roots, and a number of fine, filiform, jointed shoots, or stems ; some creeping, some floating below the surface of the water, branches solitary, axillary.

Leaves sessile, verticelled, three to six-fold, oblong-lanceolate, from one eighth to half an inch long. MALE FLOWERS axillary, sessile, from one to four in the verticel, much smaller than the female. *Calyx, spathe* one-flowered, sub-globular, murexed, bursting irregularly. *Perianth* three-leaved ; *leaflets* obovate, reflexed. *Corol* three-petalled ; *petals* wedge-formed, reflexed. *Filaments* three, short, ascending. *Anthers* very large, two-lobed, opening with an elastic jerk, pollen white, very large grained. FEMALE FLOWERS on distinct plants, axillary, generally solitary, though sometimes there are two from the same verticel. *Spathe, perianth,* and *corol,* as in the genus ; no nectary. *Germ* sessile, subulate, ending in the long, sub-erect receptacle of the flower which elevates it above the water while expanded. *Stigmas* three, lanceolate. The *capsule* has the appearance of a silique, sometimes murexed, one-celled. *Seeds* from three to five, oblong, pointed at each end, lodged as in the leguminous plants ; their attachments I could not discover. III. 752

Note. When the male flowers are ready to expand, the murexed spathe bursts, the flowers are then quickly detached, and swim remote from the parent plants, on the surface of the water, in search of the female flowers, resting on the extremities of the reflexed leaflets of the perianth, and petals of the corol ; what a wonderful economy!

The Bruhmapoor sugar refiners use this herb, while moist, to cover the surface of their sugars, as clay is used in the West India Islands, and in two or three days the operation is finished exceedingly well.

4. V. *octandra. Willd.* iv, 651. *Corom. pl.* ii. 165. 475.

Stemless. *Leaves* radical, ensiform. *Scape* straight. *Male flowers* octandrous.

Saivala. *Asiat. Res.* iv. 275.

Hind. and *Beng.* Shyala, Semar, also Halla.

A grass-like plant, growing in standing, shallow, sweet water.

Root fibrous, annual. *Leaves* radical, linear, tapering to a fine point, serrulate, smooth ; from nine to thirty-six inches long, and half an inch or less broad. MALE FLOWERS. *Peduncles* or rather *scapes* axillary, straight, a little compressed, the length of the leaves, or more, so as to raise the flowers above the surface of the water. *Spathe* one-leaved, sub-cylindric, somewhat diaphanous, open at top for the unexpanded flowers to pass through. *Flowers* numerous, in succession, white, pretty large, pedicelled ; *pedicels* lengthening when the flowers are ready to expand, so as to elevate them just above the mouth of the spathe. *Perianth proper* three-leaved ; *leaflets* lanceolate. *Corol* three-petalled ; *petals* linear, recurved, more than twice the length of the calyx. *Filaments* eight, of unequal length, erect, shorter than the petals. *Anthers* linear. *Germ* abortive, three-sided. *Styles* three. FEMALE FLOWERS on a separate plant. *Scape* shorter, and thicker than in the male. *Spathe* as in the male, one-flowered. *Flowers* white, elevated above the germ, and above the mouth of the spathe by a very long receptacle, style, or pedicel, which makes up for the shortness of the scape, and brings the flowers nearly of a height with the tops of the leaves. *Perianth* three-parted. *Corol* as in the male, only the petals are here filiform. *Germ* cylindric, obsoletely three-sided, sessile in the bottom of the spathe, ending in the above mentioned flower-elevating receptacle. *Style* III. 753

Page Carey Ed. three-cleft to near the base; *divisions* filiform, white. *Capsule* as in the genus.

They are all found in lakes and in stagnant pools of sweet water, and as in V. *spiralis*, the male flowers, when ready to expand, detach themselves from the plant, and are borne, as the wind directs over the surface of the water, resting on the tips of their reflected petals in search of the female flowers.

SALIX. Schreb. gen. N. 1493.

MALE. *Ament* cylindric. *Calyx* scaly. *Corol* none, but a nectariferous gland in the centre. FEMALE. *Calyx* the scales of the ament. *Corol* none. *Style* two-cleft. *Capsule* one-celled, two-valved. *Seeds* downy.

1. S. *tetrasperma. Willd* iv. 657. *Corom. pl.* 1. *N.* 97.

Arboreous. *Leaves* lanceolar, serrulate, acuminate, smooth. *Stamina* from six to eight. *Capsule* four-seeded.

Sans. Burun.

Beng. Pani-juma.

Hind. Baishee.

III. 754 This is the only species of *Salix* I have yet found in India. It is a middle-sized tree, a native of the banks of rivulets and moist places among the Circar mountains. Flowering time the cold season.

Trunk erect but short, as thick as a man's body. *Head* large, very ramous. *Branchlets* twiggy. *Leaves* alternate, short-petioled, lanceolar, fine-pointed, most minutely serrate, smooth above, whitish below, from two to four inches long. MALE. *Ament* filiform, its peduncle often leaf-bearing, issuing from the dry, smooth, brown involucre-like scales of the bud. *Scales* small, cup-formed, with a long depending tongue-like lip, giving to the whole the appearance of a slipper. *Filaments* from six to eight, retrofracted, three or four times longer than the tongue of the perianth. *Anthers* twin, singly orbicular and grooved. FEMALE. *Aments* shorter than in the male; *perianth* the same. *Germ* long-pedicelled. *Style* as long as the capsule. *Stigmas* two, spreading. *Capsule* cordate, opening from the apex, one-celled, four-seeded. *Seeds* oblong, involved in much fine white cotton; which does not adhere to them, but is inserted with them into the bottom of the capsule.

2. S. *Babylonica. Willd.* iv. 671.

Arboreous. *Branchlets* pendulous. *Leaves* linear-lanceolate, serrate, smooth, glaucous underneath. *Male flowers* diandrous.

A native of the middle parts of Asia. In Bengal it blossoms during the hot season.

The scales of the ament in the male, form something like a one-lipped hairy cup which is not more than one-fourth the length of the filaments. On each side, without and within, the insertion of the filaments, is an oblong, yellow, smooth gland, rather shorter than the scales.

DIOECIA TRIANDRIA.

OSYRIS. Schreb. gen. N. 1497.

III 755 *Male calyx* trifid. *Corol* none. *Female calyx* as in the male. *Corol* none. *Germ* superior, one-celled, one-seeded; *attachment* lateral; *stigma* sub-rotund. *Capsule* one-celled, two-valved, one-seeded. *Embryo* obliquely inverse, and furnished with a perisperm.

O. *peltata. R.*

Arboreous. *Leaves* peltate, ovate-cordate, entire.

A native of the Circar mountains; and of various other mountainous countries. The male tree of *Ricinus Mappa, Linn.* is so much like this, as scarcely to be distinguished; the female of that I have not yet seen.

Leaves alternate, petioled, peltate, cordate, pointed, entire, three-nerved, pretty smooth above, hairy underneath, from six to nine inches long, and about four or five inches broad. *Petioles* round, smooth, nearly as long as the leaves. *Stipules* obliquely oblong, caducous. MALE. *Panicles* or *compound racemes* thin, axillary, erect, interrupted. *Bractes* broad-cordate, notched, downy, many-flowered. *Flowers* exceedingly minute. *Calyx* three-parted; *divisions* ovate, crenate, downy. *Corol* none. *Filaments* three, as long as the calyx. *Anthers* peltate, four-sided, four-celled; *cells* covered with lids. FEMALE. *Racemes* axillary, simple, erect. *Bractes* broad-lanceolate, notched, pointed, from one to two-flowered. *Calyx* as in the male. *Corol* none. *Germ* superior, globular, covered with glutinous farina, one-celled, containing a single ovulum attached to the inside of the cell a little below the stigma. *Style* none. *Stigma* lateral, large, scabrous. *Capsules* round, of the size of a pea, fleshy, covered with clammy, waxy grains, with a groove on each side from the base to the vertex, one-celled, two-valved. *Seed* single, spherical, attached as in the germ. *Integuments* three; the *exterior* one smooth, shining, of a blackish brown; the *middle* one nuciform, black, thick, hard, and very rough on the outside, between it and the exterior tunic is a quantity of soft whitish pulp; the *in-*

III. *ner* one pure white, and very thin. *Perisperm* conform to the seed, white, fleshy. *Embryo*
756 obliquely inverse, pure white. *Cotyledons* round-cordate, three-nerved. *Plumula* minute. *Radicle* oblong, pointing obliquely up between the vertex and the stigma.

All the young parts of this plant are covered with more or less of soft, resinous, adhesive matter, which smells strongly of turpentine.

EXCOECARIA. Schreb. gen. N. 1498.

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MALE. *Ament* cylindric, imbricated with one-flowered scales. *Corol* five-petalled. FEMALE. *Ament* scaly. *Perianth* three-leaved. *Corol* none. *Styles* three. *Capsule* tricoccous.

1. E. *Agallocha. Willd.* iv. 864.

Leaves alternate, ovate-cordate, serrulate, smooth. *Ament* axillary.

Arbor excæcans. *Rumph. Amb.* ii. *t.* 79, 80.

Geria of the inhabitants of the Delta of the Ganges, where it is very common, growing to the size of a small, crooked, rather ill-looking, stunted tree.

Leaves alternate, about the extremities of the branchlets, petioled, ovate and ovate-cordate, smooth on both sides, remotely and slightly serrate, pointed, with two glands at the base circumscribed with a purple border, about two inches long. *Petioles* about an inch long, smooth, channelled. *Stipules* small, fine-pointed. *Male calyx. Aments* axillary, often crowded, cylindric, while young imbricated with fine spiral rows of one-flowered, reniform scales, which lengthen by age, when the flowers become distinct, and at a small distance from each other. *Corol* no other than five, small squamæ round the base of the filaments. *Filaments* three. *Anthers* of two large lobes. *Female calyx. Aments* solitary, axillary, the lower half containing from two to four, or even six, rather remote, one-flowered scales, the remaining part imbri- III. cated with numerous, small, neuter scales. *Perianth*, or corol of three, cordate, pointed leaf- 757 lets. *Stamens*, none. *Germ* superior, three-lobed. *Styles* three, recurved. *Stigmas* simple. *Capsule* tricoccous.

The wood-cutters of the Sunderbunds, who are the people best acquainted with the nature of this tree, report the pale, white, milky juice thereof to be highly acrid and very dangerous, producing inflammation and ulceration. The only use made of the tree, so far as I can learn, is for charcoal and firewood. Agallochum of any sort is, I believe, never found in this tree.

2. E. *integrifolia. R.*

Leaves alternate, petioled, oblong, entire, polished. *Male aments* axillary, with many-flowered scales.

A native of the Moluccas.

STILAGO. Schreb. gen. N. 1381.

MALE. *Calyx* three-lobed. *Corol* none. *Anthers* twin. FEMALE. *Calyx* as in the male. *Corol* none. *Germ* superior, one-celled, two-seeded; *attachment* superior. *Drupe* one-seeded. *Embryo* inverse and furnished with a perisperm.

1. S. *tomentosa. R.*

Shrubby, tomentose. *Leaves* acuminate. *Stipules* subulate. *Spikes* cylindric, amentaceous; *male flowers* triandrous.

Tengaree the vernacular name in Silhet, where this shrub is found indigenous, flowering in May and June, and ripening its fruit in September.

Trunk scarcely any, but many sub-erect branches, dividing into numerous, very tomentose, erect twigs; whole height three or four feet. *Leaves* alternate, sub-sessile, oblong, entire, very finely acuminate, hairy on both sides, from four to twelve inches long, by from two to five broad. *Stipules* subulate, hairy, about an inch long. *Male spikes* terminal, filiform, III. erect, generally paired, amentaceous, half the length of the leaves, very downy. *Calyx* four- 758 lobed, one of the lobes smaller; all downy and ciliate. *Corol* none. *Nectary* of three circular, concave, smooth lobes, into which the three filaments are inserted. *Filaments* three, much longer than the calyx. *Anthers* of two, large, distinct lobes, each with a polliniferous pit in the apex. *Female spikes* axillary, and terminal, one, two, or three together, long, slender. *Flowers* numerous, minute, sessile. *Bractes* minute, one under each flower. *Calyx*, from three to four-lobed, downy. *Corol* none. *Nectary* saucer-shaped, entire, embracing the base of the germ. *Germ* ovate, hairy above the nectary, one-celled, two ovula in each, attached to the top of the cell. *Style* scarcely any. *Stigma* of about three emarginate divisions. *Drupes* obliquely oblong, succulent, of the size of a pea, one-celled. *Nut* conform to the drupe, hard, variously sulcated both within and without, one-celled, two-valved. *Seed* solitary, oval. *Perisperm* conform to the seed. *Embryo* inverse; described and figured by *Gærtner. vol.* i. *p.* 188. *t.* 39.

2. S. *Bunius. Willd.* iv. 714.

Arboreous. *Leaves* alternate, entire, lanceolate-oblong, polished. *Spikes* axillary and terminal; *male flowers* triandrous, with an abortive column in the centre.

Bunius sativus. *Rumph. Amb.* iii. *t.* 131, the large branch.

Noeli-tali. *Rheed. Mal.* iv. *t.* 56. which I have already quoted for *Antidesma alexiteria*; they are the same.

The seeds were received from Nepal about seven years ago; now, 1809, the trees raised from them, are from twenty to thirty feet high, very ramous, with a smooth barked, stout trunk. Flowering time the month of March; the fruit ripens in September.

Leaves alternate, short petioled, oblong, and lanceolate-oblong, but rather narrower towards the base, entire, smooth, of a shining green on both sides. *Stipules* ovate-cordate, acuminate, caducous. *Spikes* in the female solitary, and terminal; in the male axillary, and from one to III. three or even more together, sub-cylindric. *Flowers* numerous, sessile, or in part immersed 759 in the substance of the spikes, small, of a greenish yellow. MALE. *Proper perianth* urceolate, with the mouth obscurely three-lobed. *Corol* none. *Filaments* three, much longer than the calyx. *Anthers* two-lobed, bearing the pollen in pits on their apices. *Pistil*, no germ, but an

Page Carey Ed. inserted, truncated, pyramidical body occupies its place; in its base the filaments are inserted alternate with as many small glands. FEMALE FLOWERS on a distinct tree. *Calyx* as in the male but smaller. *Stamens* none. *Stigmas* three. *Drupe* of the size and shape of a large Berberry, smooth, succulent, sub-acid, when ripe of a deep red inclining to black. *Nut* compressed, rugose, one-seeded.

The tree is of a quick growth, very handsome and particularly beautiful when loaded with the numerous bunches of ripe, shining, deep red fruit, which are sub-acid, and palatable.

3. S. *diandra. Willd.* iv. 714. *R. Corom. pl.* ii. *N.* 166.

Leaves oblong, smooth. *Stipules* ensiform. *Spikes* axillary, and terminal. *Male flowers* diandrous.

Teling. Pella-gomoodoo.

A tree, a native of the mountainous parts of the Circars.

Flowers in June, bearing male flowers on one tree, and female ones on another.

Leaves alternate, short-petioled, nearly bifarious, oval or oblong, entire, smooth; from two to four inches long, and from one to two broad. *Stipules* narrow, lanceolate. *Spikes* filiform, terminal, many-flowered. *Bractes* minute, one-flowered. *Flowers* very small, approximate. MALE. *Calyx* cup-formed, obtusely four-toothed. *Corol* none. *Filaments* two, four times longer than the calyx. *Anthers* twin; singly oval. FEMALE. *Calyx* inferior, closely embracing three-fourths of the germ, from four to five-toothed. *Corol* none. *Nectary*, a yellow
III. fleshy ring surrounding the base of the germ. *Germ* superior, obliquely ovate. *Styles* two,
760 spreading, one of them always two-cleft. *Stigmas* simple. *Drupe* minute, succulent, one-celled. *Nut* one-celled, very small.

The berries are eaten by the natives when ripe. The wood serves for various uses.

4. S. *lanceolaria. R.*

Shrubby, smooth. *Leaves* lanceolar. *Stipules* ensiform. *Spikes* terminal, filiform; *male flowers* diandrous.

A very bushy, large shrub, void of all sorts of pubescence; a native of Chittagong. In the Botanic garden it blossoms during the rainy season.

CATURUS. Schreb. gen. N. 1449.

Male calyx none. *Corol* trifid. *Female calyx* three or four-parted. *Corol* none. *Styles* three. *Capsule* tricoccous.

C. *spiciflorus. Willd* iv. 714.

Shrubby. *Leaves* long-petioled, cordate, serrate. *Spikes* pendulous, longer than the leaves.

Cauda-felis agrestis. *Rumph. Amb.* iv. *t.* 37. *f.* 1. the male, and *f.* 2. the female.

Acalypha hispida. *Burm. Fl. Ind. t.* 61. *f.* 1. would be a tolerable representation of the female, if the spikes were longer, and pendulous.

Exclude Watta-tali. *Rheed. Mal.* v. *t.* 32, which is more like my *Rottlera dicocca*, and totally different from a *Caturus*.

DIOECIA TETRANDRIA.

TROPHIS. Schreb. gen. N. 1502.

MALE. *Ament* imbricated, globular. *Calyx* four-leaved or none. FEMALE. *Calyx* four-leaved or none. *Germ* superior, one-celled, one-seeded; *attachment* superior. *Berry* one-seed-
III. ed. *Embryo* inverse, curved, no perisperm.
761 1. T. *aspera. Willd.* iv. *p.* 793.

Arboreous. *Leaves* oblong, unequally serrate, scabrous.

Sans. Sakhotuka.

Hind. and *Beng.* Syora, or Sheora.

Tinda-parua. *Rheed. Mal.* i. *t.* 48.

Streblus asper. *Lourier. Cochin Ch.* 734. and 754.

Achymus pallens. *Solander*, in the *Banksian Herbarium.*

Teling. Barinka.

Is generally shrubby, though sometimes it grows to be an ill-looking, scraggy, crooked small tree; is common every where in India. Flowers in the cold season.

Leaves alternate, short-petioled, oblong, unequally serrate, or crenulate, hard, very rough; about two inches long by one broad. MALE. *Ament* axillary, globular, short peduncled, one or two. *Flowers* minute, sessile, greenish-yellow, from ten to fourteen from the small globular spike, or ament. *Calyx* or *corol* four-leaved; *leaflets* orbicular, spreading. *Female flowers* on a separate plant. *Peduncles* from one to five, axillary, short, one-flowered. *Calyx* or *corol* as in the male, permanent. *Germ* ovate, one-celled, with one ovulum attached to the top of the cell a little on one side of the origin of the short *style*, which soon divides into two filiform, rough, tapering stigmas. *Berry* of the size of a pea, nearly round, smooth; when ripe yellow, crowned with the remaining style on one side of the vertex, one-celled. *Seed* single, round. *Integuments* two, both thin, but uncommonly distinct. *Perisperm* none. *Embryo* conform to the seed, curved, greenish. *Cotyledons* two, very unequal, the largest being nineteen twentieths of the whole embryo, on one side divided half way through into two lobes. The male cotyledon is hid between the lobes of the larger one. *Plumula* two-lobed. *Radicle* subcylindric, curved, superior, with its apex immediately under the remaining style.

The leaves of this plant are employed by the natives to polish ivory; the wood is used only for fuel. The berries are greedily eaten by birds.

2. T. *spinosa. R.*

Arboreous, thorny. *Leaves* oblong-lanceolate, towards the apex grossly serrate, smooth. *Female calyx* twice the length of the berry.

Teling. Sukalee.

This seems a new species uniting *Trophis* and *Taxus* in itself. It is a rare plant, a native of the tops of mountains, where it becomes a small tree. It flowers during the cold season.

Trunk crooked. *Branches* very irregular. *Thorns* very strong, straight, sharp, scattered over every part of the tree, often leaf and flower-bearing. *Leaves* scattered, very short-petioled, oblong, pointed, with the outer half grossly serrate, waved, smooth, two and a half inches long by one broad. *Stipules* acute. MALE. *Aments*, &c. as in the former species, excepting an imbricated involucre. FEMALE. *Peduncles* axillary, single, short, one-flowered, erect. *Calyx* four; *leaflets* at the base cordate, from thence tapering to a long narrow point, waved, large, permanent, increasing with the fruit. *Germ* superior, resting in an obliquely cup, or helmet-like receptacle, the upper and black part of which has a perforation for the passage of the style, which is two-cleft, &c. as in T. *aspera. Berry* obliquely oval, size of a cherry, half immersed in the increased receptacle, pulpy, one-seeded. The female flowers are eaten in curries by the natives.

BATIS. Schreb. gen. N. 1503.

MALE. *Ament* roundish. *Calyx* none. *Corol* none. *Berry* compound.

1. B. *spinosa. R.*

Sub-arboreous, with long scandent thorny branches. *Leaves* oblong, entire, smooth.

Trophis *spinosa. Willd.* iv. *p.* 735.

Cudranus. *Rumph. Amb.* v. *t.* 15. *f.* 1. or 2. seems the female plant of this.

Teling. Koriti.

A scarce, very large, woody, straggling, or climbing shrub, or small tree, with very long, drooping, slender branches; every axill is armed with a remarkably long, sharp, somewhat recurved thorn. *Leaves* scattered, rather remote, short-petioled, obovate, or oval, obtuse, entire, reflexed at the margins, hard, smooth, shining; from two to three inches long by one and a half broad. MALE. *Aments* peduncled, scattered or axillary. FEMALE. *Flowers* on a separate plant. *Ament* or receptacle peduncled, small, fleshy above the base of the thorns. *Flowers* aggregate. *Calyx* none. *Corol* none. *Germs* about ten or twelve, oval, immersed in the pulp of the ament, or receptacle. *Style* single, crooked, long, downy. *Berry*, seldom more than one comes to perfection, globular, of the size of a large pea, one-seeded, as it comes to maturity the ament, or receptacle is obliterated, and appears a single, one-seeded berry. This plant is very fit for hedges, and fuel, I know no other uses it is put to.

2. B. *fruticosa. R.*

Shrubby, armed. *Leaves* alternate, oblong, entire, acuminate. *Berries* dry, conglomerate.

A native of Chittagong. It flowers in October and November, and the seed ripens in April and May.

VISCUM. Schreb. gen. N. 1504.

Male calyx four-parted. *Corol* none. *Filaments* none. *Anthers* growing to the calyx. *Female calyx* four-leaved, above. *Corol* none. *Style* none. *Berry* one-seeded.

1. V. *monoicum. R.*

Monoicous, shrubby, parasitic. *Leaves* opposite, lanceolar, from three to five-nerved. *Flowers* axillary, three-fold, sessile, male and female ones mixed on the same plant. *Berry* long.

Found by Mr. Crommelin on trees growing in the Delta of the Ganges, in blossom about the beginning of the hot season.

Branches numerous, woody, opposite and dichotomous, jointed, round and smooth. *Leaves* opposite, sub-sessile, lanceolar, somewhat pointed, entire, fleshy, from three to five-nerved; they are often a little falcate; about two inches long. *Flowers* axillary, and at the divisions of the branchlets, in sessile fascicles of generally three, the centre one is generally male, and the lateral two female. *Bracles*, a transversely oblong, two-pointed, permanent, cup or common calyx in which the flowers sit. *Berry* long.

2. V. *verticillatum. Willd.* iv. 741.

Shrubby, with sub-verticelled branches. *Leaves* oblong, three-nerved. *Flowers* axillary, from three to seven together, sessile.

Teling. Sundra-woodiniki.

On trees on the coast of Coromadel. It flowers in the hot season.

3. V. *opuntioides. Willd.* 740.

A very ramous, parasitical shrub. *Branches* proliferous, compressed, leafless.

A native of Coromandel.

4. V. *confertum. R.*

Monoicous, parasitic, very ramous, smooth. *Leaves* opposite, sub-sessile, lanceolar, from three to five-nerved. *Flowers* sessile, crowded into little axillary heaps. *Berries* oblong.

Grows on mangoe trees in the Silhet district.

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MONETIA.

Male calyx four-toothed. *Corol* four-petalled. *Female calyx* and *corol* as in the male.
III. *Style* none. *Stigma* glandular. *Berry* one or two-seeded.
765 M. *barleriodes. L'Herit. Strip. Nov.* i. *t.* 1. *Willd.* i. 669.

Shrubby. *Spines* quatern. *Leaves* opposite, spinous-pointed.

Beng. Trikanta-juti.

Hind. Kanta-goor-kamai.

Teling. Tella-upee.

This is one of the most common shrubs on every part of the coast of Coromandel, it grows freely in all situations, and is in flower and fruit most part of the year. *Stem* scarcely any, but *branches* innumerable, opposite, spreading in all directions, forming a close, impenetrable bush, something like the Furze; *young branches* four-sided. *Thorns* axillary, four-fold, spreading, very sharp, from one to two inches long. *Leaves* opposite, short-petioled, reflexed, oval, acute. MALE FLOWERS axillary, sessile, single or crowded, and also interrupted spikes, small, yellow. *Bractes* minute, acute, pressing the calyx. *Calyx* four-toothed; teeth obtuse. *Petals* four, lanceolate, recurved. *Filaments* shorter than the petals. *Anthers* oval, incumbent. *Pistil* a conical gland in its place. FEMALE axillary, solitary, sessile, between the two thorns. *Calyx* and *corol* as in the male. *Filaments* four, small. *Anthers* broad-sagittate, sterile. *Germ* superior, globular. *Style* none. *Stigma* large, glandular. *Berry* globular, of the size of a pea, when ripe white, succulent. *Seeds* two. *Berries* eaten by men and birds.

MYRICA. Schreb. gen. N. 1510.

MALE. *Ament* with crescent-shaped scales. *Corol* none. FEMALE. *Ament* oblong; *scales* as in the male. *Corol* none. *Styles* two. *Drupe* one-seeded. *Embryo* inverse, without perisperm.

M. *integrifolia. R.*

Leaves lanceolar, entire, smooth; *scales* of the female aments reniform-cordate, one or
III. two-flowered. *Drupes* oval, granulated.
766 Sophee, the vernacular name in Silhet, where it is indigenous, and grows to the size of a large bush. Flowering time December and January, and the fruits ripen in May, when they are pickled by the natives, and used as a condiment. In its raw state, this fruit though inviting to the eye, is too sour to be relished. *Branchlets* very ramous; the tender shoots considerably hairy. *Leaves* permanent, alternate, approximate, round, every part of the apices of the branchlets short-petioled, lanceolar, entire and perfectly smooth; from three to six inches long, by about one broad. *Stipules* none. FEMALE. *Aments* axillary, generally cylindric, rarely more than an inch long, considerably villous, many-flowered. *Scales* reniform-cordate, somewhat acuminate, sprinkled on the back with small yellow, shining grains, one or two-flowered, intermixed with many small fleshy scales resembling a perianth. *Germ* minute, ovate, one-celled, containing a single ovulum attached to the cell. *Styles* two, or two-cleft. *Drupe* oval, the size of a prune. *Nut* oblong, thick and very hard, a little flattened, the two edges rather extended and somewhat sharp, densely clothed with an immense quantity of fine white hair in pencilliform tufts. The *pulp* consists of innumerable, closely impacted, but distinct, clavate, succulent, yellow bodies. *Seed* ovate-oblong. *Integument* single, membranaceous. *Perisperm* none. *Embryo* inverse. *Cotyledons* conform to the seed, amygdaline. *Radicle* superior.

NAGEIA. Gært.

Male calyx from four to five-leaved. *Corol* none. *Female calyx* from three to five-leaved. *Corol* none. *Germ* three-celled; *cells* two-seeded; *attachment* superior *(axipendula.) Styles* two or three. *Drupe* one-seeded. *Embryo* inverse, and furnished with a perisperm.

III. N. *Putranjiva. R.*
767 *Leaves* alternate, narrow-oblong, acutely serrulate. *Flowers* triandrous; *filaments* more or less coalesced. *Drupes* ovate.

Pootrunjeeva the Sanscrit name. *Pootra* signifies a son and *jeeva* life. Dr. Berry of Madras informs me, the nuts are known, and sold in the bazars at that place by the very same appellation; and observes that they are strung by parents, and put round the necks of their children, to preserve them in health.

Pongolam. *Rheed. Mal.* vii. *t.* 59.

Pootrunjeeva, Pitanjya, Pootranjubkum, Pitanja, are some of its numerous Asiatic synonyms.

Teling. Kudra-juvi.

In the carpology it is nearly allied to Gærtner's *Nageia*, i. 191. *t.* 39.

A native of the various mountainous countries of Coromandel and Hindoosthan, where it grows to be a large timber tree with an erect straight trunk; and a large spreading shady head, composed of innumerable expanding branches with bifarious branchlets. Flowering time March and April, and the fruit ripens in January. The wood is white, close-grained and very hard.

Leaves alternate, short-petioled, bifarious, lanceolate-oblong, acutely serrulate, rather obtuse, with the base generally oblique, smooth, shining, waved a little round the margin, from three to four inches long and one or one and half broad. *Stipules* minute, alternate,

villous. MALE. *Flowers* short-pedunculed, numerous, minute, yellow, collected into small globular heads in the axills, sometimes on short, axillary, glomerate racemes. *Calyx* five-leaved, or deeply five-parted; *segments* lanceolate, obtuse, or acute. *Corol* none. *Filaments* one, two or three; when one trifid; when two, one of them is bifid. *Anthers* always three, two-lobed, two-celled. FEMALE. *Racemes* small, simple, from last year's ramuli; there are also single pedunculed flowers scattered about the lower part of the present year's shoots, as in the lower axills thereof. *Flowers* larger than the male ones, green. *Calyx* as in the male. *Corol* none. *Stamina* none. *Germ* oval, villous, three-celled, with two ovula in each, attached from their apex to the top of the axis. *Styles* three, short. *Stigmas* large, crescent-shaped. *Drupe* obovate, or oval, of the size of a large gooseberry, smooth, white, one-celled. *Nut* oval, more or less pointed at both ends, sometimes triangular, very hard, rugose, one-celled. *Seed* solitary, conform to the nut. *Integuments* two; the *exterior* one which adheres to the nut, harder and lighter coloured; the *inner* one free, darker coloured, and spongy. *Perisperm* conform to the seed. *Embryo* inverse, nearly as long as the perisperm. *Cotyledons* oval, three-nerved. *Radicle* sub-cylindric, superior.

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DIOECIA PENTANDRIA.

ZANTHOXYLUM.

MALE. *Calyx* five or more parted. *Corol* none. *Stamina* from five to eight. FEMALE. *Calyx* five-parted. *Corol* none. *Germs* as many as five, one-seeded; *attachment* superior. *Capsules* as many as five, one-seeded. *Embryo* inverse, and furnished with a perisperm.

Z. alatum. Roxb.

Shrubby, ramifications straight. *Thorns* stipulary; *leaflets* from two to five pair, opposite, lanceolate, serrulate, common petioles winged. *Panicles* axillary, male flowers with from six to eight stamina.

Hind. Durmur.

Zanthoxylum. *Asiat. Res.* vi. 376.

A native of Nepal, and other mountainous countries north of Bengal, Rohilcund, and Oude. In the Botanic garden they blossom during the hot and rainy seasons.

III. 769

Trunk short. *Branches* several, straight, expanding, covered with dark brown bark, spotted with small, scaleous, white dots; our plants now ten years old, are from ten to twelve feet high. *Prickles* stipulary, straight, dark-coloured and sharp. *Leaves* alternate, unequally pinnate, from two to four inches long. *Leaflets* from three to thirteen, five or seven most common, opposite, sessile, lanceolate, in young plants crenulate, pretty smooth on both sides, with a few pellucid points containing a fragrant juice. *Petioles* winged. *Stipules* none. MALE. *Racemes* axillary, often compound, shorter than the leaves. *Flowers* minute, pale yellow. *Calyx* small, one-leaved, with from six to eight acute divisions. *Corol* none. *Filaments* six, seven, eight, much longer than the calyx. *Anthers* twin. *Pistillum* or hemispheric gland, with two or three elevations in the centre, like so many stigmas. FEMALE. *Racemes* as in the male. *Flowers* very minute, greenish yellow. *Calyx* as in the male. *Corol* none. *Stamens* none. *Germs* superior, as far as five, three or four are most common, one-celled, containing two ovula, attached to the top of the inner angle of the cell. *Styles* single, shorter than the germs, recurved. *Stigmas* single. *Capsules*, in general one, two, or three come to maturity, roundish, reniform, or ovate, of the size of a small pea when recent, when dry wrinkled, and much smaller, short-pedicelled, one-celled, two-valved, opening round the apex. *Seeds* solitary, conform to the capsule, attached to the middle of the margins of the capsule, on one side. *Integuments* two; the *exterior* one of a shining black, thick, porous, and brittle; the *inner* one thinner and brown. *Perisperm* conform to the seed, fleshy. *Embryo* inverse, nearly as large as the perisperm. *Cotyledons* round-ovulate, three-nerved. *Radicle* superior, oblong.

Every part of the plant possesses a peculiar aromatic pungency, which I cannot well compare to any smell or taste I am acquainted with. The seeds are used medicinally by the natives of the countries where the plants grow.

ANTIDESMA. Schreb. gen. N. 1518.

III. 770

MALE *Calyx* five-leaved. *Corol* none. *Anthers* twin. FEMALE. *Calyx* as in the male. *Corol* none. *Stigmas* from three to five. *Drupe* one-seeded. *Embryo* inverse, and furnished with a perisperm.

1. A. *pubescens. Willd.* iv. 763. *Roxb. Corom. pl.* ii. *No.* 167.

Leaves oblong, entire, downy. *Stipules* subulate. *Spikes* terminal, panicled.

Tsjeriam-cottam. *Rheed. Mal.* v. *t.* 11.

Teling. Polaree.

A small tree, a native of the Circar mountains. Flowering time the beginning of the rainy season.

Leaves alternate, short-petioled, bifarious, oval, entire, downy, from two to four inches long, and from two to three broad. *Stipules* subulate, downy. *Spikes* numerous, terminal, and from the upper axills, downy; those of the male tree much longer and more slender. *Bracteas* lanceolate, and downy. *Flowers* very small, of a greenish yellow. MALE. *Calyx* five-leaved, ovate, hairy. *Corol* none. *Filaments* five, spreading, longer than the calyx.

Page Carey Ed. *Anthers* double, singly globular. *Pistil* no other rudiments of one, than a tuft of wool. FEMALE. *Calyx* as in the male. *Corol* none. *Nectary* a yellow fleshy ring surrounding the base of the germ. *Germ* superior, obliquely oblong, hairy. *Styles* two, short, two-cleft, spreading. *Stigmas* simple, *Drupe* minute. *Nut* one-seeded.

The berries are eaten by the natives.

2. A. *paniculata. Willd.* iv. 764.

Spikes panicled. *Leaves* round, oval, villous. *Stigma* stellate. *Drupe* round.

Beng. Khoodi Jamb.

A small ramous tree, with light ash-coloured bark, common in the forests of Bengal. Flowering time the month of April, the seed ripens in July.

III. 771 *Leaves* alternate, sub-bifarious, short-petioled, round-oval, often emarginate, entire, villous, particularly underneath; lanceolate, caducous. *Spikes* terminal, and axillary, panicled, sub-cylindric, downy. *Bractes* minute, one-flowered, from one to three inches long, and nearly as broad. *Stipules* downy. *Flowers* numerous, minute, sessile, of a pale greenish yellow. MALE. *Calyx* five-leaved; *leaflets* oblong, woolly. *Corol* none. *Filaments* five, twice, or more, longer than the calyx, inserted round the base of an hemispheric, hairy receptacle. *Anthers* twin. *Pistil* no other than a gland in the centre of the receptacle. FEMALE. *Calyx* five-toothed. *Corol* none. *Nectary*, a yellow, villous ring surrounding the base of the germ. *Germ* obliquely ovate. *Style* scarcely any. *Stigma* generally of five stellate divisions. *Berry*, rather drupe in this species, small, round, smooth, when ripe of a dark purple, pulp of a pleasant subacid taste. *Nut* single, one-seeded. *Embryo* inverse, and furnished with a perisperm.

SPINACIA. Schreb. gen. N. 1520.

MALE. *Calyx* four or five parted. *Corol* none. FEMALE. *Calyx* two, or four-cleft. *Corol* none. *Styles* four. *Seed* one, within the indurated calyx. *Embryo* annular, with an inferior radicle, and furnished with a perisperm.

S. *tetrandra. Roxb.*

Annual, erect. *Leaves* variously lobed. *Flowers* hispid, sessile, the *male* ones tetrandrous the *female* calyx two-parted.

Hind. and *Beng.* Pinnis.

Arab. and *Pers.* Ispanj, or Ispanaj; these point out the derivation of our generic name which has been doubtful.

It is much cultivated in Bengal and the adjoining provinces; being a pot-herb held in considerable estimation by the natives.

III. 772 *Stem* erect, from twelve to twenty-four inches high, round, smooth, piped, succulent, sometimes reddish. *Leaves* alternate, the lower ones very long-petioled, variously lobed with lobes of an acute triangular shape, smooth on both sides. MALE. *Flowers* on long terminal glomerate spikes, and on shorter ones from the axill; very numerous, sessile. *Calyx* four-parted. *Stamens* four. *Anthers* twin, very large. FEMALE. *Flowers* axillary, sessile, crowded. *Calyx* two-tipped, with a projecting horn in each side, growing into spines when the seed is ripe. *Styles* generally four, white, tapering. *Capsule* one-celled, one-valved, armed, with two opposite short horns, and crowned with the small remaining calyx.

CANNABIS. Schreb. gen. N. 1522.

MALE. *Calyx* five-parted. *Corol* none. FEMALE. *Calyx* one-leaved, entire, opening on the side. *Corol* none. *Styles* two. *Seed* solitary, shut in the calyx. *Embryo* curved, inverse, without perisperm.

C. *sativa. Willd.* iv. 768.

Sans. Banga, or Ganjika.

Arab. Kinnab.

Hind. and *Pers.* Bang.

Beng. Ganga.

Teling. Ganjai.

Cannabis Indica. *Rumph. Amb.* v. *t.* 77.

Kalengi cansjava. *Rheed. Mal.* x. *t.* 60. the male; Tsyeru cansjava, *t.* 61. the female.

Indigenous amongst the hills and mountains north of India, and common every where in the gardens of the natives throughout Asia. The leaves of the male plant, as well as the flowers of the female are dried, and mixed with tobacco for smoking. They also bruise and mix with water for drinking the flowers of the male plant; this preparation is called Sid-

III. 773 dhee. They are all powerfully narcotic. The bark they make no use of in India, though equally strong, when carefully prepared, as the hemp of Russia. But Captain Hardwicke, on whom we can depend, observes, *As. Res.* vi. *p.* 376. that the natives in several parts of the mountains above Hurdwar manufacture a coarse, thick cloth from the bark, which the poorer people wear.

I perfectly agree with Willdenow, in thinking all the varieties, if even such they can be called, centre in one species. From the same seed and even on the same plant, I have found the leaves both opposite and alternate; and sometimes the more rare male and female flowers on the same individual, and even hermaphrodite.

DIOECIA HEXANDRIA.

Page Carey Ed.

CALAMUS. Schreb. gen. N. 589.

MALE. *Perianth* three-parted. FEMALE. *(Female hermaphrodite* or *hermaphrodite.) Perianth* three-toothed. *Corol* three-parted. *Stamina* six, abortive. *Germ* superior, three-celled; *cells* one-seeded; *attachment* inferior. *Berries* backwardly imbricated with cartilaginous scales, generally one-seeded. *Embryo* in the base of the perisperm.

1. C. *Zalacca. Willd.* ii. 204.

Shrubby, not scandent nor flagelliferous, stoloniferous. *Leaflets* numerous, approximate, alternate, opposite, linear, bristly on both sides. *Inflorescence* radical. *Berry* obliquely turbinate, generally three-seeded.

Calamus Zalacca. *Gært. Sem.* ii. *t.* 139. *f.* 1.

Zalacca. *Rumph. Amb.* v. *t.* 57. *f.* 2.

A native of the Malay Islands. The pulp of the fruit is eaten by both Malays and Europeans.

2. C. *humilis. R.*

Shrubby, not scandent nor flagelliferous. *Leaflets* lanceolar, smooth, many-nerved. *Spines* few, but long and strong.

A native of Chittagong. III.

3. C. *erectus. R.* 774

Shrubby, erect, no flagelli. *Leaflets* rather remote, equidistant, opposite and alternate, linear-lanceolar. *Spines* sub-verticelled. *Spadix* compound. *Berries* oblong.

Sun-gotta, the vernacular name in Silhet, where it grows with an erect trunk, like the true palms, of about fifteen feet in height; when divested of the sheaths, from three to four inches in circumference; and the joints from two to three inches long. The poorer natives use the seed as a substitute for areca.

4. C. *draco. Willd.* ii. 203.

Scandent, destitute of flagelli, dreadfully armed with long flattened elastic spines, often in rows and united at the base. *Leaflets* alternate, ensiform, spinous, bristled. *Spadix* decompound, oblong.

Palma juncus draco. *Rumph. Amb.* v. *p.* 114. *t.* 58. *f.* 1. good.

Dsirenung. *Kæmpf. Amoen. Exot.* 552.

A native of Sumatra and the Malay Islands. Flowering time March and April.

Trunk while the plants are young, erect, and then resemble an elegant, slender palm tree, armed with innumerable dark coloured, flattened, elastic spines, often disposed in oblique rows, with their bases united. By age they become scandent, and overrun trees to a great extent. *Leaves* pinnate, their sheaths and petioles armed as above described. *Leaflets* single, alternate, ensiform, margins remotely armed with stiff, slender bristles, as are also the nerves; from twelve to eighteen inches long and about three quarters of an inch broad. *Spadix* of the *female hermaphrodite* inserted by means of a short, armed petiole on the mouth of the sheath opposite to the leaf, oblong, decompound, resembling a common oblong panicle. *Spathes* several, one to each of the four or five primary ramifications of the spadix, lanceolate, leathery; III. all smooth except the exterior or lower one which is armed on the outside. *Calyx* of the 775 female or rather *female hermaphrodite. Perianth* turbinate, ribbed; *mouth* three-toothed, by the swelling of the germ it splits into three portions, and in this manner may be seen adhering with the corol, to the ripe berries. *Corol* three-cleft; *divisions* ovate-lanceolate, twice as long as the calyx, permanent. *Filaments* six, very broad, and inserted into the base of the corol. *Anthers* filiform, and seemingly abortive. *Germ* above, oval. *Styles* short. *Stigma* three-cleft; *divisions* revolute, glandular on the inside. *Berry* round, pointed, of the size of a cherry.

5. C. *latifolius. Roxb.*

Scandent. *Leaves* flagelliferous; *leaflets* in a few remote fascicles, of three or four each, broad, lanceolar, many-nerved, smooth, convex above.

Korak Bet of the natives of Chittagong, where it is indigenous and runs over trees to an immense length. When freed from the sheaths of the leaves it is about as thick as a slender walking cane. Plants introduced by Mr. W. Roxburgh, in 1801, into the Botanic garden, flowered for the first time in November and December 1809, when they had attained to the height of about forty feet.

Spines numerous on the stems, sub-verticelled, very large, flat and divaricate. On the flagelli fascicled and recurved. *Leaves* alternate, pinnate, from six to twelve feet long including the whip or flagelli, which terminates the common petioles as in many of Rumphius's figures; and the leaf of his *Palma juncus equestris, vol.* v. *t.* 56. is tolerably like that of my plant, but their size is very different. *Leaves* in seven or eight remote fascicles, of three or four each, broad-lanceolate, very erect, many-nerved, smooth on both sides; with the margins triflingly spinous-dentate, and the upper surface always convex, from ten to eighteen inches long, and from three to six broad. MALE. *Spadix* supra-decompound: all the III. divisions bifarious. *Flowers* small, of a greenish yellow, each sitting in a cup composed of 776 two concave sheathing bractes. *Calyx* three-toothed. *Corol* three-parted. *Filaments* six, inserted on the imperforated base of the corol. *Anthers* incumbent. *Pistillum* none, a small three-lobed gland occupies its place.

6. C. *rudentus. Willd.* ii. 203.

Scandent. *Leaves* flagelliferous; *leaflets* numerous, equidistant, uniform. *Male spadix*

Page Carey Ed. super-decompound.

Palma juncus albus. *Rumph. Amb.* v. *t.* 53.

A Native of the Moluccas, from thence introduced into the Botanic garden in 1798, where in thirteen years it blossomed for the first time, when it had attained to the length of thirty feet, and its general thickness, when deprived of the sheaths of the leaves, was that of a very stout walking cane; the joints are smooth, and from eight to twelve inches long. *Leaves* alternate as in the genus. *Leaflets* numerous, equi-distant, and equally arranged on each side of the petiole, uniform; margins armed with minute spinulæ, pointing forward, and the chief nerves here and there with a stiff spinous bristle; about two feet long, and about an inch broad. *Petioles* armed with a few, short, recurved spines on the exterior part of the under side, and many smaller straight ones on the upper; from eight to ten feet long, besides its terminal, drooping, armed whip, which is not much shorter than the body, or foliferous parts. *Sheaths* armed with slender spines disposed in belts. *Male spadices* from the sheaths of the petioles, supra-decompound. *Spathes* numerous, armed with very small, short, straight spines. *Calyx*, *corol* and *stamina*, exactly as in the other species.

7. C. *verus. Willd.* ii. 203.

Scandent. *Leaves* flagelliferous. *Leaflets* numerous, equi-distant, uniform, three-nerved; *stipes* dreadfully armed with innumerable flat, ensiform spines. *Spadix* panicled, oblong.

III. 777

Palma juncus verus angustifolius. *Rumph. Amb.* v. *t.* 54. *f.* 2.

A native of Amboyna, &c. In the Botanic garden are many plants of this species, brought from the Molucca Islands in 1798, where in twelve years they began to blossom, and in that time their length was under thirty feet; and the ratan, when cleaned, about as thick as the little finger, with joints from six to eight inches long. In this the whole of the petioles, particularly toward the base, are more armed than in any other species I have yet seen, with flat, thin, elastic, very sharp, tortoise-shell coloured spines of all sizes, from a line to two inches long.

8. C. *extensus. R.*

Scandent. *Leaves* flagelliferous; *leaflets* alternate, remote, equi-distant, narrow-lanceolar. *Spines* in belts, slender. *Berries* spherical.

Deu-gullar the vernacular name in Silhet, where it is indigenous, and is of great extent, say two to three hundred yards; when cleaned toward the base, it is not thicker than a man's fore-finger, but as thick as the wrist toward the apex. The length of the joint is from six to twelve inches.

9. C. *quinquenervius. R.*

Scandent. *Leaves* flagelliferous; *leaflets* few, remote, equi-distant, lanceolar, five-nerved. *Spines* distinct, few, short and strong; *spadix* decompound.

Hurnur-gullar the vernacular name in Silhet, where this species is found, running over trees, to a great extent; the ratan when cleaned is about as thick as a man's finger throughout, and the joints from six to eight inches long.

10. C. *Rotang. Willd.* ii. 202.

Scandent. *Leaflets* solitary, equi-distant, sublinear-lanceolate; *sheaths* flagelliferous.

III. 778

Sans. Vetra, vetus.

Beng. Bet, or Sanchi-bet.

I cannot take upon me to quote any of Rumphius's figures for this plant. It is a native of Bengal, and the Coromandel coast, delights in a rich, moist soil, where there are bushes and trees for it to climb on. Flowering time the rains; the fruit ripens during the cold seasons.

Root fibrous. *Stem* joined, climbing to a vast extent, enveloped in the thorny sheaths of the leaves; with them it is about as thick as a man's little finger; when they are removed, it is in thickness, and every other respect, a common ratan. *Leaves* pinnate, from eighteen to thirty-six inches long. *Leaflets* opposite or alternate, sessile, linear-lanceolate, armed in the margins with minute bristles pointing forward, and a few distinct, long, erect bristles on the upper surface, from six to twelve inches long. *Sheaths* cylindric, armed with numerous, strong, straight, compressed thorns. *Petioles* sheathing, the leaflet-bearing portion compressed, channelled, and armed with both straight and recurved thorns on the under side. *Flagelli*, one from the sheath of each leaf near its mouth they are very long, slender, drooping or waving, and well armed, resembling the slender lash of a whip; many of Rumphius's figures of these plants have such terminating the rib or rachis of the leaves. MALE. *Calyx* universal; *spathe* none; partial many, scattered. *Spadix* supra-decompound, drooping, being the above mentioned flagelli much enlarged, with numerous, partial, truncate spathes, with alternate, decompound, bifarious, recurved spikes therefrom, the ramifications thereof recurved, bearing in two rows on their convex sides numerous minute greenish flowers. *Perianth* three-parted, smaller than the corol, permanent. *Corol* one-parted. *Tube* imperforated. *Border* three-parted; divisions oval, permanent. *Filaments* six, thick at the base, tapering, nearly as long as the corol and inserted on the mouth of its tube. *Anthers* incumbent. *Germ* none, but there

III. 779

is the rudiment of a three-cleft stigma. FEMALE. *Calyx*; *sheaths* as in the male. *Spadix* decompound, *perianth* and *corol* as in the male. *Filaments* six, united at the base round the germ. *Anthers* arrow-shaped, abortive. *Germ* round. *Style* short, three-cleft, divisions or stigmas recurved. *Berries* round, of the size of a small gooseberry, imbricated backward with barky scales, one-celled, one-seeded, between the bark and the seed there is a considerable portion of whitish juicy pulp of a sharp acid taste. *Seed* solitary, marked with many irregular depressions and elevations, and on one side there is a large, deep, roundish pit, a little below it near the base is lodged the monocotyledonous embryo.

As already observed the full grown-plant, when divested of the sheaths of the leaves, resembles so much the common ratan of Malacca, that I have scarcely a doubt of their being the same; for that reason the specific name *rotang* is adopted until we are better acquainted with those figured by Rumphius. Page Carey Ed.

11. C. *fasciculatus. Roxb.*

Scandent. *Leaflets* in many fascicles, ensiform, margins spinous, bristly. *Sheaths* flagelliferous.

Tsjeru-tsjurel, *Rheed. Mal.* xii. *p.* 121. *t.* 64. agrees in its foliage better with this than with the former.

Palma juncus viminalis. *Rumph. Herb. Amb. vol.* v. *t.* 55. *f.* 2. agrees pretty well with this species, but not his description.

Sans. Umba-vetus.

Hind. and *Beng.* Bura-bet.

With C. *Rotang* this is a native of thickets, and woods all over Bengal, Cuttack, and many other places; though I never saw it to the southward of Ganjam. Flowering time, the rainy season.

Stem as in C. *Rotang* but thicker, when young, viz. from four to eight feet high, they are erect, at which time they resemble a beautiful palm on a small scale; when longer they lean in search of support, and finally climb over trees, and bushes like the other species, and are equally extensive. *Leaves* and *petioles* as in C. *Rotang*, but more armed. *Leaflets* collected into fascicles of two, three, or four, on the opposite sides of the stipes, with a vacant space of considerable extent between; they are broader considerably than in C. *Rotang*, scarcely so long, and armed with spinous bristles on the edges and both sides of the nerves. MALE. *Flagelli, spathes, spadix, perianth, corol,* and *stamens,* as in the former species. FEMALE. *Perianth, corol* abortive; *stamens* and *pistillum* as in C. *Rotang. Berries* as in the former, but small. III. 780

The stems divested of the sheaths of the leaves, are about as thick as a man's fore-finger, and employed for walking canes like those of the ground ratan, *Rhapis flabelliformis.*

12. C. *polygamus. R.*

Scandent. *Spines* sub-verticled. *Sheaths* flagelliferous. *Inferior leaflets* in remote fascicles of three or four, above single and alternate, or opposite, all linear, with a few bristles on the margins and nerves underneath. *Male* and *hermaphrodite flowers* on the same supra-decompound spadix.

Hoodoom Bet of the people of Chittagong, where it is indigenous, and a most extensive rambler; the general thickness when cleaned is that of a stout walking cane. Its growth is exceeding slow, for in ten years it had acquired a stem of only five feet in length, and the leaves from ten to twelve more.

13. C. *tenuius. R.*

Polygamous, scandent. *Leaves* pinnate; *leaflets* numerous, solitary, equi-distant, alternate, three-nerved, linear. *Sheaths* flagelliferous. *Spadix* decompound. *Hermaphrodite calyx* and *corol* urceolate.

Bandhari Bet of the inhabitants of Chittagong, where it is indigenous. It is a beautiful, delicate species; when divested of the sheaths of the leaves, and cleaned, it is not thicker than a common quill, and of the colour of the common ratan. Flowering time, the rainy season. III. 781

Stems simple, perennial, climbing to a great extent; the extremities inserted in the armed sheaths of the leaves, including these, it is scarcely so thick as a common ratan. *Leaves* oblong, equally pinnate, nearly two feet long. *Leaflets* from twenty to thirty on each side, equidistant, alternate, linear polished, three-nerved; *margins, apices,* and *nerves* bristly; six inches long, and scarcely half an inch broad at the broadest part. *Petioles* armed. *Flagelli* from the sheaths, simple, armed, as in the other species. *Spathes* numerous, sheathing, sub-cylindric, one for each division of the spadix, even to the pairs of flowers. *Spadices* occupy the place of the flagelli on a few of the spathes, decompound; primary branches, four, five, or six, remote, flexuose, with about half a dozen alternate, recurvate branches on each side. *Hermaphrodite* and *male flowers* in alternate pairs, the latter short-pedicelled. MALE. *Calyx* shorter than the corol, unequally two, or three-toothed, corol supported on a fleshy gibbous receptacle, border two or three-cleft. *Filaments* four, five, or six. *Anthers* sagittate. HERMAPHRODITE. *Calyx* and *corol* equal, gibbous, with a contracted, three-toothed mouth. *Filaments* six, united in a ring round the lower half of the germ; *anthers* sagittate, large, and seemingly fertile. *Germ* ovate, one-celled, containing three seeds attached to the bottom of the cell. *Style* scarcely any; *Stigma* three-cleft; *segments* rugose and recurvate.

14. C. *pencillatus. R.*

Scandent. *Leaflets* thirty-four pair, regularly alternate except the terminal two, which are united, lanceolate, seven to nine-nerved; margins entire and smooth, a pencil of bristles from the apex of each. *Sheaths* flagelliferous.

Found by Mr. Roxburgh in the forests of Pulo Pinang running over trees. It is more slender than the common ratan, and less so than the next species, C. *gracilis.*

15. C. *gracilis. R.*

Scandent. *Leaves* with from six to ten pair of linear-lanceolate, three-nerved leaflets in three remote fascicles; *sheaths* flagelliferous. III. 782

Mapoori Bet of the Hindoos of Chittagong.

Tsjera-tsjurel. *Rheed. Mal.* xii. *t.* 64.

A native of the forests of Chittagong, where Mr. W. Roxburgh found it climbing over

Page Carey Ed. trees and bushes to a great extent, and in flower in the month of May. This species is uncommonly slender when divested of the sheaths of the leaves and dry, scarcely as thick as a common quill, in texture firm and elastic, covered with a smooth, straw-coloured crust as in the common ratan.

Stems simple, perennial, climbing to a great extent; all the tender or younger parts toward their extremities invested, in the armed sheaths of the leaves, including these about as thick as a man's little finger. *Leaves* alternate, recurved interruptedly pinnate, if I may be allowed to call a pinnated leaf so, which is destitute of smaller leaflets between the principal ones, from one to two feet long. *Leaflets* collected in three opposite bundles of from two to four pair each, with much more of the rachis left naked between them than the spaces they occupy, sessile, doubled backwardly at the base, linear-lanceolate, bristly, pointed, both surfaces lucid, three-nerved; nerves on the upper side as well as the margins, bristly, from three to five inches long, and less than one inch broad. *Rib* or *rachis* carinated along the upper side, when young covered with ferruginous dust, rounded underneath, and armed with recurved prickles. *Flagelli* or *tendrils*, issue single as in the other species, from near the mouths of the sheaths of the leaves; they are long, jointed, slender as a pack-thread, drooping, sheathed, armed with numerous, very sharp, recurved prickles. MALE. *Spadix* from the mouths of the sheaths or opposite sides of the flagelli, compound, jointed; joints approximate, sheathed; ramifications recurved, bearing two rows of sessile flowers on their convex side. *Calyx* one-leaved, tridentate, sitting on the joints of the rachis in a three-toothed cup, which may be
III. called a lower or exterior calyx. *Corol* three-parted, with the base fleshy, and partly imper-
783 vious. *Filaments* six, thick at the base, and inserted on the mouth of the fleshy impervious tube of the corol. *Anthers* linear, incumbent. *Pistillum*, a small, three-toothed, abortive, style-like body is all that is to be found.

16. C. *monoicus*.

Monoicous, scandent. *Leaflets* numerous, alternate, linear-lanceolate, polished, and bristly; *sheaths* flagelliferous; *stamens* monadelphous.

Native place uncertain. It grows in the Botanic garden to be about the size of the common ratan, and differs from it only in being monoicous, the divisions of the corol lanceolate, and in the *filaments* being very completely united. Flowering time the rainy season.

It is needless to give a full description of this plant, which is exactly like C. *Rotang*, except in the above-mentioned circumstances. The *male* flowers are about as numerous as the *female* ones, generally one of each from each of the annular scales of the branches of the spadix. The common ratan (C. *Rotang*) I have always found completely dioecous; this must therefore be considered a distinct species.

PHŒNIX. Schreb. gen. N. 1694.

MALE. *Calyx* three-toothed. *Corol* three-petalled. FEMALE. *Calyx* and *corol* as in the male. *Germs* three, one-celled, one-seeded; *attachment* interior. *Drupe* oblong, pointed, one-seeded. *Embryo* in the back or convex side of the perisperm.

1. P. *acaulis. Buch.*

Stemless. *Leaves* radical, pinnate; *leaflets* folded, ensiform, in sub-opposite fascicles
III. pointing many ways, the lower spinous.
784 A native of Behar. Flowering time in the Botanic garden the cold season. The seed ripens in April and May.

Stem none in plants ten years old; at this age when in flower, the whole body of the plant, including the inflorescence, but exclusive of the foliage, is of an ovate form, and not exceeding six or eight inches in height from the surface of the ground. *Leaves (fronds,* L.) pinnate; from two to six feet long. *Leaflets* in nearly opposite, rather remote fascicles; the superior ones folded, slender, ensiform, and about eighteen inches long; the lower ones small, straight, rigid, and ending in very sharp, spinous points. *Petioles (stipes)* near the base flat, towards the apex triangular, smooth. MALE. *Spathes* and *spadix* as in the female, hereafter described. *Flowers* alternate, solitary, sessile, small, pale yellow. *Calyx* one-leaved, triangular; *angles* or *lobes* acute and unequal. *Corol* three-petalled; *petals* obliquely-lanceolate, acute, slightly united at the base. *Filaments* six, very short, inserted into the base of the corol. *Anthers* linear, nearly as long as the petals. *Pistil* none. FEMALE. *Spathes* universal, axillary, solitary, one-valved, about six inches long, with their base rather below the surface of the earth, generally splitting into two portions down the middle, on each side. *Spadix* ramous, composed of many, simple, short, erect, flexuose branches; all are smooth, and of a pale yellow. *Flowers* alternate, solitary, sessile, in bractiform notches on the sides of the branches of the spadix. *Calyx* cup-shaped, truncate, with three obscure points at equal distances on the margin. *Petals* three, sub-rotund, thick and fleshy, concave, smooth. *Nectary* a small, six-toothed cup, in which the germs sit. *Germs* three, each one-celled, and containing a single ovulum attached to the middle of the cell on the inside. *Styles* three, recurved, small, and short. *Stigma* small. *Drupe* oval, fleshy, small, smooth, of a bright red, of the size of a very small olive, one-celled. *Seed* solitary, oblong, with a deep longitudinal groove on one side.
III. *Embryo* in the middle of the back, or convex side of the seed.
785 2. P. *farinifera. Willd.* iv. 731. *R. Corom. pl.* i. *N.* 74.

Stem scarcely any. *Leaves* pinnate; *leaflets* opposite, rigid, the lower pair ending in spines.

Phœnix pusilla. *Gært. Sem.* i. *t.* 29. *Lourier. Cochin Ch.* 753.

Teling. Chilta-eita.

This dwarf species of the date tree is a native of dry, barren ground, chiefly of the sandy lands at a small distance from the sea near Coringa. It flowers in January and February. The fruit ripens in May. Page Carey Ed.

Trunk, the little it has is only about one or at most two feet high, and so entirely enveloped in the sheaths of the leaves that it is never seen, the whole appearing like a large round bush. *Leaves* pinnate. *Leaflets* opposite, sword-shaped much pointed, smooth, of a deep green. *Spathes* axillary, one-valved, concave on the inside, fitting the trunk or base of the leaf immediately within it; this concavity is bordered by two sharp edges; convex on the outside, there splitting longitudinally, leathery, smooth, withering. *Spadix* erect, very ramous, branches simple, spreading in every direction, from eight to twelve inches long. MALE FLOWERS. *Calyx* small, slightly three-toothed. *Petals* three, oblong, white, rigid. *Filaments* six, very short, inserted into a fleshy globular receptacle. *Anthers* oblong, erect. FEMALE FLOWERS on a separate plant. *Calyx* as above. *Petals* three, orbicular, concave, equal, rigid, lasting. *Germs* three, though never more than one ever increases in size, the other two always wither, although they contain the rudiment of a seed every way like the fertile germ; ovate, each ending in a short recurved style. *Stigma* simple. *Berry* when ripe, of a shining black, of the size of a large French bean; the *pulp* is sweet and mealy, but in small quantity, the natives eat them as gathered from the bush without any preparation. *Seed* cartilaginous, of the shape of the berry, grooved longitudinally, as in the common date, pretty smooth, brown on the outside, of a light grayish white within, on the middle of the back there is a small elevation, under which is an oblong pit containing the embryo or first principle of the new plant. III. 786

The leaflets are wrought into mats for sleeping upon, &c. The common petioles are split into three or four, and used to make common baskets of various kinds, but they are not so good for this purpose as the Bamboo, which is very elastic, much more durable, and splits easily. The small trunk when divested of its leaves, and the strong brown fibrous web that surrounds it at their insertions, is generally about fifteen or eighteen inches long, and six in diameter at the thickest part; its exterior or woody part consists of white fibres matted together, these envelope a large quantity of farinaceous substance, which the natives use for food in times of scarcity. To procure this meal, the small trunk is split into six or eight pieces, dried, and beat in wooden mortars, till the farinaceous part is detached from the fibres; it is then sifted to separate them, the meal is then fit for use. The only further preparation it undergoes, is the boiling it into a thick gruel, or as it is called in India, *Kanji;* it seems to possess less nourishment than the common sago, and is less palatable, being considerably bitter when boiled; probably a little care in the preparation, and varying the mode, might improve it; however, it certainly deserves attention, for during the end of the last, and beginning of this year, and even again at this present time, May 1792, it has saved many lives. Rice was too dear, and at times not to be had, which forced many of the poor to have recourse to these sorts of food. Fortunately it is one of the most common plants on this part of the coast, particularly near the sea.

3. P. *dactylifera. Willd.* iv. 730.

Leaves pinnate, unarmed; *leaflets* folded together, linear-lanceolate, strait.

Numerous attempts have been made to familiarize this useful tree to the soil and climate of India, but I have not been able to learn that any one has been successful. I have raised thousands from seed in the Botanic garden, many of which I have tried to bring to perfection there, and have distributed others over many parts of the country. The greatest advance that I have yet known, has been that some male trees lived to blossom, soon after which they have uniformly perished. III. 787

Captain Benjamin Blake who was lately at Bussora informs me that he used frequently to walk in these date gardens, and observed their method of impregnating the *female flowers*, which was by making a slit in the *spathe* a little before it would burst spontaneously, and thrusting into it a branch, or a part, of the *male spadix*, where it was left. This he says, was the whole of the operation, and it appears a much more certain method, than hanging the male branch over the female.

4. P. *sylvestris. R.*

Leaflets in sub-opposlte fascicles, ensiform, spinous-pointed, pointing four ways.

Katou-indel. *Rheed. Mal.* iii. *t.* 22. 23. 24. and 25.

Teling. Pedda-eita.

Sans. Khurjura.

Beng. Khujjoor.

Elate sylvestris. *Linn.*

This tree is very common all over India, all soils and situations seem to suit it equally well. Flowering time the beginning of the hot season.

Its parts of fructification are exactly as in P. *farinifera*, except that here are six small nectarial scales round the base of the germs. But it differs from it most conspicuously in growing to be a tree with a long, pretty thick trunk, and having longer yellowish or reddish fruit. This tree yields *Tari* or Palm wine during the cold season. The method of extracting it destroys the appearence and fertility of the tree. The fruit of those that have been cut for drawing off the juice being very small. III.

The mode of extracting this juice is by removing the lower leaves and their sheaths, and cutting a notch into the pith of the tree near the top, from thence it issues and is conducted by a small channel made of a bit of the Palmyra tree leaf into a pot suspended to receive it. On the coast of Coromandel this Palm juice is either drank fresh from the tree, 788

Page Carey Ed. or boiled down into sugar, or fermented for distillation, when it gives out a large portion of ardent spirit commonly called *Paria aruk* on the coast of Coromandel. Mats and baskets are made of the leaves.

The Bengalees call this tree *Khujjoor.* They also boil the juice into sugar. In the whole Province of Bengal about fifteen thousand maunds, or about a hundred thousand hundred-weight is made annually. At the age of from seven or ten years, when the trunk of the trees will be about four feet high, they begin to yield juice, and continue productive for twenty or twenty-five years. It is extracted during the cold months of November, December, January, and February; during which period, each tree is reckoned to yield from one hundred and twenty to two hundred and forty pints of juice, which averages one hundred and eighty pints, every twelve pints or pounds is boiled down to one of *Goor* or *Jaguri,* and four of *Goor* yield one of good powder sugar, so that the average produce of each tree is about seven or eight pounds of sugar annually.

Another statement presented to me, gives a much larger produce, viz. the average produce of each tree is sixteen pints per day, four of which will yield two pounds of molasses, and forty of molasses will yield twenty-five pounds of brown sugar. The difference is so great, that I cannot well reconcile them, but am inclined to give most credit to the first.

Date sugar, as it is here called, is not so much esteemed as cane sugar, and sells for
III. about one fourth less.
789 5. P. *paludosa. R.*

Sub-arboreous. *Leaflets* solitary, ensiform, flaccid, bifarious. *Embryo* in the base of the seed.

Sans. Hintala.

Beng. Hintal.

A native of the lower parts of the Delta of the Ganges called the Sunderbunds, where it forms a considerable portion of those impenetrable woods which completely cover that extensive tract of country.

Trunk straight, as thick as a man's leg, and from six to sixteen feet high. *Leaves* pinnate, oblong, from three to six feet long, with the base extended into a multitude of tough fibres that embrace the stem and interior leaves. *Leaflets* solitary, opposite and alternate, bifarious, the lower few pairs short and spinous, the rest flaccid, sword-shaped, smooth, with acute filiform points, the longest of them from twelve to eighteen inches. *Spathe* simple as in the P. *sylvestris* and *farinifera. Spadix* ramous; *branches* numerous, generally undivided, and spreading in every direction. So far the male and female plants agree. MALE FLOWERS, *Calyx* cup-shaped, less regularly three-toothed, than in the above-mentioned two species. *Corol.* The three petals unite at the base into a firm receptacle which supports the stamens. *Filaments* six, short. FEMALE FLOWERS on a distinct plant. *Calyx* as in the male. *Corol.* The three petals distinct, roundish, concave. *Nectary* six small scales surrounding the base of the germs. *Germs* three; *styles* recurved, (although as in P. *sylvestris* and *farinifera* there are always three perfect germs, yet never more than one of them comes to maturity.) *Berry* the size of a field bean, oval, smooth, of a deep shining black, when ripe the pulp is a dirty looking, soft, greenish black substance, of an intolerable taste. *Seed* cartilaginous, as in P. *farinifera,* but in this species the *embryo* is lodged near the base of the seed.

III. The trunks of the smaller trees serve for walking sticks, and the natives have an idea
790 that snakes get out of the way of any person having such a staff. The longer ones serve for rafters to their houses, and leaves for thatch.

BORASSUS. Schreb. gen. N. 1689.

Male spathe universal, many-leaved. *Perianth* three-leaved. *Corol* three-petalled. *Female spathe* as in the male. *Perianth,* or *corol,* or both, from eight to twelve-leaved. *Germ* superior, three-celled; *cells* one-seeded, *attachment* interior. *Drupe* three-seeded. *Embryo* in the apex of the perisperm.

B. *flabelliformis. Willd.* iv. 800. *Corom. pl.* i. *N.* 71. and 72.

Lontarus domestica. *Rumph. Amb.* i. *t.* 10. *Gært. Fruct.* 21. *t.* 3.

Carimpana, *Rheed. Mal.* i. *t.* 9. the female tree; and *Ampara, t.* 10. the male.

Sans. Tala. See *Asiat. Res.* iv. *p.* 311.

Beng. Tal.

Eng. Palmyra.

Teling. Patoo-Tody, the name of the male tree, and Peuty or Nama-Tody, the female. Common all over India. It flowers in the hot season in Bengal, and the seeds ripen in August.

FERRIOLA. R.

MALE. *Calyx* and *corol* three-cleft. FEMALE. *Calyx* and *corol* three-cleft. *Germ* superior, three-celled; *cells* two-seeded; *attachment* superior; *style* single. *Berry* from one to three-seeded. *Embryo* inverse, amply furnished with perisperm.

F. *buxifolia. Willd.* iv. *p.* 798. *R. Corom. pl.* i. *N.* 45.

Trumbilli, that is *Iron wood,* of the Tamuls.

Pishinna of the Telingas.

III Among the Circar mountains this grows to be a small tree, but in the low countries, it
791 is only a shrub. It flowers during the hot season.

Trunk irregular. *Bark* of a dark rust colour. *Branches* very numerous, and very irregularly disposed. *Leaves* alternate, short-petioled, oval, entire, very smooth, shining, about half or three quarters of an inch long, by half an inch broad. MALE. *Flowers* from the axills of the lower leaves, three together smaller than the female ones. *Filaments* six, short, inserted round a semi-globose receptacle. *Anthers* oblong. *Pistil* none. FEMALE. *Flowers* axillary, single, sessile, very small, white. *Calyx* three-cleft. *Corol* three-cleft, hairy on the outside. *Stamens* none. *Germ* superior, oval, three-celled, with two ovula in each attached to the top of the axis. *Style* short. *Stigma* three-toothed. *Berry* superior, of the size of a large pea, round, smooth, when ripe yellow, from one to three-celled, partitions thin, tough, membranaceous. *Seed* one; I never found more, in each cell, differing in shape according to the number of fertile cells in the berry. *Integument* single, rather fleshy. *Perisperm* conform to the seed, of a soft, hairy, semi-pellucid consistence. *Embryo* inverse, nearly as long as the perisperm, a little curved. *Cotyledons* two, cordate. *Plumula* very minute. *Radicle* superior, clavate, pointing directly to the umbilicus. Page Carey Ed.

The berries of this tree are universally eaten when ripe, and are very well tasted.

The wood is dark coloured, remarkably hard, and durable. It is employed for such uses, when its size will admit, as require the most durable heavy wood.

SMILAX. Schreb. gen. N. 1528.

MALE. *Calyx* six-leaved. *Corol* none. FEMALE. *Calyx* six-leaved. *Corol* none. *Germ* superior, three-celled; *cells* one-seeded; *attachment* superior. *Styles* three. *Berry* from two to three-seeded. *Embryo* in the base of the perisperm.

1. S. *glabra. R.* III. 792

Scandent. *Stem* and *branches* unarmed, columnar, polished. *Leaves* lanceolate, acuminate, rounded at the base, polish-three-nerved, glaucous underneath. *Umbellets* axillary, simple, sessile, solitary. *Calycine leaflets* broad, obcordate; sessile.

A native of the Silhet district, and of the adjacent Garrow country, where it is called *Hurina* or *Hurina-shook-China.* Its root is large and tuberous, and not to be distinguished by the eye, from the medicinal drug brought from China, under the name of *China root.* The natives of the above countries use a decoction of the fresh root annually, for the cure of sores and venereal complaints. It flowers about the end of the rains, and the seed ripens in the hot season. It is remarkable for its broad, obcordate, calycine leaflets, and large, two-lobed, sessile anthers. The flower-buds are broad and three-lobed.

2. S. *lanceæfolia. R.*

Scandent. *Stem* and *branches* unarmed, columnar, polished. *Leaves* lanceolar, three-nerved, polished. *Umbellets* simple, axillary, solitary, peduncled. *Calycine segments* linear-oblong.

Gootea-shook-China the vernacular name amongst the people of the eastern frontier, where the plant is indigenous, and its large tuberous roots much used in medicine; they are so like those of the *Smilax China* as not to be distinguished by the eye. It cannot therefore be Louriero's S. *lanceolata,* which he says has a long filiform root, not tuberous. By the natives where the plants grow, the juice of the fresh root is taken inwardly for the cure of rheumatic pains, and the refuse after extracting the juice, laid over the parts most pained. The whole plant, root included, is very much like my *glabra,* except in the structure of the flowers.

3. S. *Pseudo-China. Willd.* iv. 785. III. 793

Scandent. *Stem* and *branches* unarmed, columnar, smooth. *Leaves* from cordate to cordate-oblong, smooth, acuminate, five-nerved; *petioles* sub-cylindric, without stipuli.

Beng. Muhesha.

A native of the Garrow hills.

4. S. *laurifolia. Willd.* iv. 779.

Scandent, somewhat angular, armed. *Leaves* lanceolate and narrow, oblong, smooth, triple-nerved to the acuminate apex. *Umbels* compound. *Berries* from one to three-lobed, from one to three-seeded.

Koomari or *Koomari-sookh-China* of the Bengalees.

A native of the Garrow hills, where it grows to be a large, rambling, scandent, well armed perennial. Flowering time the hot season; the seed ripens about the end of the rains. On the permanent base of the petioles, just under the tendrils, are two large semicordate stipulæ. The umbellets are numerous, particularly in the female, forming panicles, with the long peduncled umbels in alternate threes on the angles of the rachis.

5. S. *retusa. R.*

Scandent, columnar, much armed. *Leaves* sub-ovate, cordate, retuse; with a triangular point, triple-nerved, with a fine intermarginal pair, stipules stem-clasping.

A most extensive rambler, a native of Bengal, every part glossy, which is indeed the case with all the East Indian species known to me.

6. S. *macrophylla. R.*

Scandent; *stem* and *branches* cylindric and prickly. *Leaves* sub-rotund, five-nerved, glossy. *Female umbellets* a few on a common axillary peduncle.

A very large and extensive, well armed species, a native of Bengal, where it blossoms about the beginning of the rains in June, and the seed ripens in October and November. III. 794

Root permanent, somewhat tuberous. *Stems* sometimes herbaceous, sometimes biennial or even perennial, round, armed with short sharp prickles, but void of every thing like pubes-

Page Carey Ed. cence, scandent, and ramous toward the root, as thick as a walking cane; the general length several fathoms; some seasons they perish down to the root at the approach of winter, and appear about the beginning of the hot season in February and March, at other times they are biennial or more. *Leaves* alternate, short-petioled, round, entire, five-nerved, glossy, six or eight inches each way. *Petioles* short, keeled, with the margins of the channel winged. *Tendrils* petiolary, undivided. FEMALE. *Peduncles* axillary, solitary, divided into two or three branches, each supporting a single, globular umbellet of large, greenish yellow, pedicelled flowers inserted on a round scrobiculate receptacle. *Calyx* six-leaved; the *inner* series narrower. *Filaments* six, slender, and abortive. *Germ* globular, three-celled, with one ovulum in each, attached to the upper end of the axis. *Styles* recurved. *Berries* the size of a pea, red, smooth, generally one, or two-seeded. *Seed, perisperm,* and *embryo* as in the genus.

7. S. *ovalifolia. R.*

Stems cylindric, armed. *Leaves* unarmed, oval, smooth, from five to seven-nerved. *Petioles* tendril-bearing. *Umbels* compound.

Beng. Koomurki.

Teling. Kunda gurvatiga.

A native of hedges, forests, and wild places.

Root tuberous. *Stems* cylindric, climbing, woody; the larger woody parts armed with sharp, strong, incurved prickles. *Tendrils* paired, from the wings of the petioles, one on each side, simple. *Leaves* alternate, short-petioled, unarmed, oval, from five to seven-nerved, smooth on both sides, entire; from five to seven inches long. *Petioles* short, winged, channelled, bearing a simple tendril on each side of their base. Jointed just above the tendrils, and there, III. 795 though the leaf drops, leaving the base with the tendrils for the support of the plant. *Umbels* axillary, compound; *umbellets* globular. *Peduncles* and *pedicels* columnar, smooth, coloured. *Bractes* two at the base of each peduncle, with smaller, reflexed, partial bracteoli to the umbellets. FEMALE. *Calyx* the three exterior leaflets larger, all revolute; *nectary* three subulate bodies within the calyx. *Germ* oblong. *Styles* short. *Stigmas* truncate. *Berries* above, red, smooth, succulent, two or three-seeded.

8. S. *prolifera. R.*

Stem and *branches* cylindric, prickly. *Leaves* unarmed, oblong, triple-nerved, with a slender marginal pair. *Umbels* proliferous, super-decompound; *umbellets* globular, long-peduncled.

A native of hedges and thickets in the vicinity of Calcutta where it blossoms in February and March.

Root strong, slender, hard, fibres springing from a small tuberous, hard, ligneous crown or base. *Stems* and *branches* perennial, scandent, of some few fathoms in length, round, armed with numerous, rather recurved, short, thick, sharp prickles. *Leaves* from lanceolar to oblong, triple-nerved, besides a very slender sub-marginal pair, entire, smooth on both sides, from three to four inches long, and from one to two broad. *Petioles* variously bent and ribbed, at the base a permanent, stipulaceous, cirriferous enlargement. MALE. *Umbels* axillary, proliferous, rather shorter than the leaves. *Umbellets* long-pedicelled, globular. *Flowers* numerous, middle-sized, green. *Calyx* six-leaved, all linear and revolute, but the three exterior ones much broader. *Corol* none. *Filaments* six, as long as the calyx. *Anthers* linear-oblong, recurved. FEMALE. *Umbels* axillary, three or four times proliferous; *umbellets* globular, long-peduncled. *Flowers* numerous, small, of a greenish yellow, long-pedicelled. *Calyx* as in the male. *Filaments* or *nectaries* six, filiform, shorter than the petals. *Germ* III. 796 superior, globular, three-celled, with one ovulum in each, attached to the top of the axis. *Styles* three, recurved. *Stigmas* large and trifid. *Berry* globose, of the size and appearance of a red currant, one or two-seeded.

9. S. *maculata, Roxb.*

Shrubby, scandent, angular, and armed. *Leaves* hastate, cordate, entire, acute, from three to seven-nerved. *Racemes* both male and female, axillary.

A native of Nepal, from thence Dr. Buchanan sent seeds to the Botanic garden in 1802, where the plants blossom during the cold season, and ripen their seed by the month of May.

Stems, or rather *branches* numerous, shrubby, scandent, or resting on the ground, angular, and armed with short, slightly recurvate prickles. *Tendrils* in pairs from the base of the petioles, simple. *Leaves* alternate, petioled, hastate-cordate, margins entire, from three to seven-nerved, smooth, maculated with patches of pale green, with a dark margin, and a few small prickles on the nerves underneath, generally from three to six inches long, and from one to three inches broad. *Petioles* about an inch long, and somewhat angular and prickly. *Racemes* axillary and terminal, solitary, generally shorter than the leaves. *Flowers* numerous, in alternate fascicles of six or eight, pedicelled, white, fragrant. *Bractes* round the base of the pedicels, scariose, and very small. MALE FLOWERS. *Calyx* six-leaved. *Leaflets* oblong, smooth, spreading, the three exterior ones somewhat larger. *Filaments* erect. *Anthers* oblong. FEMALE FLOWERS nearly as in the male. *Stamina,* six small, abortive, round, subulate bodies inserted round the base of the germ. *Germ* oblong, smooth, three-lobed. *Styles* none. *Stigmas* three, oblong, recurved. *Berry* of the size of a pea, smooth, red, three-lobed, three-celled, with a single seed in each attached to the apex of the cells. *Perisperm* cartilaginous, of a pale bluish white colour. *Embryo* simple, small, cylindric, lodged in the base of the III. perisperm, opposite to the umbilicus.

III. 797 ## *DIOSCOREA. Schreb. gen. N.* 1530.

MALE. *Calyx* six-leaved, or six-parted. *Corol* none. FEMALE. *Calyx* as in the male.

Germ inferior, three-celled; *cells* two-seeded; *attachment* superior. *Styles* three. *Capsule* three-celled. *Seeds* one or two, membranaceous. *Embryo* ascending, centripetal, and furnished with a perisperm. Page Carey Ed.

1. D. *globosa. R.*

Tubers roundish, white. *Stems* twining, six-winged. *Leaves* alternate and opposite, sagittate-cordate. *Male spikes* compound, long, pendulous, and verticelled; *female* simple.

Beng. Choopuree aloo.

I have only found this species in a cultivated state; it holds the first place amongst the tuberous roots used for food by the Hindoos of these parts, and is also the most esteemed of the yams amongst Europeans in India.

Root tuberous, roundish, often very large; internally very white. *Stems* herbaceous, twining, of great extent, about six-sided, with the angles membrane-winged, and prickly toward the root. *Leaves* opposite and alternate, long-petioled, broad, sagittate-cordate, ensiform, pointed, waved, smooth, from five to seven-nerved. *Petioles* five-winged, nearly as long as the leaves. MALE. *Spikes* axillary, simple and compound; the compound ones very long, pendulous, and sub-verticelled.

Flowers small, very numerous. FEMALE. *Spikes* axillary, simple, erect, with a few remote, very fragrant flowers.

2. D. *alata. Willd.* iv. 792.

Tubers oblong, white. *Stems* annual, twining, four-winged. *Leaves* opposite, deep cordate, from five to seven-nerved. Volubilis nigra, &c. *Sloane's History of Jamaica, vol.* i. *p.* 139. III. 798

Beng. Kam-aloo.

Katsji-Kelengu. *Rheed. Mal.* vii. *p.* 71. *t.* 38.

This species is much cultivated in various parts of India. On the Coromandel coast it is, I believe, the only species reared for food. In Bengal it holds only the second place, C. *globosa* being more esteemed; it is, however, much cultivated. Flowering time, the close of the rains.

Tubers oblong, brown on the surface, internally white, in a rich soil of great size, which perishes, after having produced that of the succeeding year. Besides the tubers, the proper roots of all those plants are fibrous, springing chiefly from, and about, the union of the stems with the tubers, and spreading in every direction. *Stems* herbaceous, twining over trees and bushes to a very great extent, somewhat four-sided, each angle enlarged with a copious, membranaceous, curled wing, otherwise smooth, often prickly toward the base. *Leaves* generally opposite; that is, the first only, that appears on the young shoots, being alternate; all long-petioled, deeply cordate, with the lobes protruding much, more or less rounded, and approximated, from five to seven-nerved, ensiform-pointed, smooth on both sides, various in size. *Petioles* nearly as long as the leaves, five-winged, enlarged at the base, coloured, and stem-clasping. MALE. *Spikes* compound, or panicled. FEMALE. *Spikes* axillary, compound, and simple, smooth. *Bractes* three-fold, one-flowered. *Flowers* remote, small, and green.

The description of *Ubium ovale, Rumph. Amb. vol.* v. *p.* 356. *t.* 125. agrees pretty well with this plant, so far as relates to the stems and leaves; but in the root they disagree; no inference can be drawn from the figure.

3. D. *rubella. Roxb.*

Tubers oblong, red-skinned; *stems* twining, six-winged. *Leaves* opposite, sagittate-cordate, smooth, five or seven-nerved, with subulate points.

Beng. Guranya aloo.

Ubium digitatum. *Rumph. Amb.* v. *t.* 121. III. 799

This I have only found in its cultivated state, the natives esteem it next in rank to *D. purpurea*, consequently it holds the fourth place in their estimation amongst the *Dioscoreas*, and is much cultivated about Calcutta.

Root tuberous, deeply tinged with red immediately under the epidermis, or scarf skin, but this colour does not penetrate deep, they are of an oblong shape, and sometimes as much as three feet long in a rich soil. *Stems* herbaceous, twining, about six-sceded, with rather winged angles, otherwise smooth, and tinged with red in most parts. *Leaves* opposite, petioled, sagittate-cordate, entire, from three to seven-nerved, smooth, subulate, pointed. *Petioles* as in D. *alata*. MALE. *Spikes* axillary, simple and compound, when simple crowded, and shorter than the leaves. *Flowers* numerous, minute. *Calyx* as in the genus. FEMALE. *Spikes* axillary, generally simple, longer than the leaves. *Flowers* remote, very fragrant. *Abortive stamens* large, and distinct, almost like those of the male.

4. D. *purpurea. R.*

Tubers oblong, reddish throughout; *stems* twining, six (or more) ribbed or winged. *Leaves* opposite, and alternate, cordate.

Beng. Lal-guranya-aloo.

This also I have found only in a cultivated state, where it is wild I know not. The root is esteemed the next best to that of D. *aiata*, consequently holds the third place amongst the *Aloos*. It is much cultivated.

Root oblong, throughout of a lighter, or darker purple, but always considerably deep in the tinge, and the farmers or cultivators of this species, say this colour is permanent. *Stems* sub-herbaceous, being sometimes perennial near the base, twining, six or more winged, or smooth; when the roots are more than one year old, the lower permanent parts of the stems are generally armed with prickles. *Leaves* opposite and alternate, long-petioled, cordate, with a subulate point, five to seven-nerved, smooth, glossy green above, paler underneath. *Petioles* stem-clasping, winged, as in the other species. *Male* and *female spikes*, as in the last described. III. 800

Page Carey Ed.

5. D. *atropurpurea. R.*

Tubers sub-rotund, purple throughout. *Stems* annual, twining four-winged, wings coloured and curled. *Leaves* profoundly cordate, from five to seven-nerved.

This is the species so extensively cultivated at Malacca, Pegu, and the eastern islands. The *tubers* are very large, of an irregular, smooth, roundish shape, and growing so near the surface of the earth, as to appear in dry weather through the cracks that they make by raising the soil over them. This, and the very deep colour of the yarn, renders it readily distinguished; the *stems* and *branches* are sometimes as far as six or seven-winged, but four is general. The petioles are also winged, much enlarged at the base, and stem-clasping.

6. D. *aculeata. Roxb.*

Tubers oblong, pendulous, the fibres of the proper roots become spinous. *Leaves* reniform-cordate, acute, from five to seven-nerved.

Cumbilium. *Rumph. Amb.* v. *p.* 357. *t.* 126. one of his varieties thereof is no doubt this very plant; but Katta Kelangu, *Rheed. Mal.* vii. *t.* 37. is too imperfect a figure to be quoted.

A native of Bengal. The roots which are of an oval form, and generally about two pounds, or more in weight, are delicately white, and during the cool season, dug up in the woods, for it is not cultivated, and carried for sale to the market at Calcutta, where they are known to the natives by the name *Mou-aloo*. In habit it resembles much the species I have

III. 801 called D. *fasciculata*, Soosni-aloo of the Hindoos.

7. D. *fasciculata. R.*

Tubers pendulous. *Stems* annual, twining, round; prickles stipulary. *Leaves* alternate, round, cordate, five-nerved.

Beng. Soosni-aloo.

This species is cultivated to a considerable extent, in the vicinity of Calcutta, not only for food, but to make starch of the roots.

Root consists of many tubers, about the size and shape of a pullet's egg, connected by slender filaments to the base of the stems, covered with a pretty smooth, light coloured, thin integument; internally they are white. *Stems* several, about as thick as a pack-thread, twining round, smooth, except here and there a small prickle, and always two at the insertion of each leaf; these I call the stipules. *Leaves* alternate, long-petioled, round-cordate, entire, pointed, from three seven-nerved, venose, slightly villous.

I have not met with the flowers of either sex, the culture and use of the roots of the various species before and hereafter mentioned, are subjects too well known, to require any thing further from me in this place; my aim is to assist in clearing up the obscurity, in which the valuable plants of this genus have hitherto been enveloped, not only with a view to gratify the Botanist, but to point out marks by which the species may be distinguished by those who are not Botanists. And the best will generally be found in the shape and colour of the root. These are permanent, and by them the Hindoo cultivator is guided; but, I fear, the criticising Botanist may find fault with me for having disregarded the Linnæan rule, which forbids placing confidence in colour. In that case he must consider D. *globosa*, *rubella* and *purpurea*, as varieties of the same species to which he has my hearty consent, if he finds it a more convenient mode, than that which I have followed.

III. 802 8. D. *pulchella. R.*

Tubers roundish, and rather small. *Stems* herbaceous, twining, columnar, smooth. *Leaves* profoundly broad-cordate, subulate, pointed, from nine to eleven-nerved, smooth. *Female spikes* axillary, crowded, pendulous.

A native of Chittagong, and so exactly like the following, *crispata*, as to be distinguished from it only by its perfectly smooth, polished, columnar stem and branches, which are perfectly free from every appearance of even an angle or rib. Flowering time in the Botanic garden, the close of the rainy season.

9. D. *crispata. R.*

Tubers roundish. *Stems* annual, twining, round, from ten to fifteen-winged; *wings* curled. *Leaves* alternate, broad-cordate. *Female spikes* pendulous; *male* panicled.

A large, elegant species, a native of the interior of Bengal, and introduced by Dr. Carey into the Botanic garden in 1798, where it blossoms during the rainy season.

Root tuberous, and small for the great size of the plant, with numerous, ramous, slender fibres issuing from every part thereof. Like potatoes the old roots perish when the new ones are produced, and may be called biennial. *Axillary tubers*, bulbs they are often called, are in this species, both numerous and large, and are proper sets to rear plants from. *Stems* annual, twining, unarmed, round, thick, many fathoms in length, beautifully ornamented with from ten to fifteen parallel, curled wings, otherwise the whole is perfectly smooth. *Leaves* alternate, petioled, broad-cordate, subulate, pointed, from seven to eleven-nerved, with numerous, parallel, anastomosing veins on both sides, from three to nine inches each way. *Petioles* shorter than the leaves, ornamented with parallel, curled wings, like the stems. FEMALE. *Spikes* axillary, crowded, perfectly pendulous. *Bractes* in pairs, unequal, one-flowered. *Flowers* alternate, rather remote, small. *Petals* or *leaflets* of the calyx six, linear, smooth, white. *Stamina*, six erect, short, emarginate, abortive glands. The *capsule* has never come

III. to maturity in this garden.

803 10. D. *anguina. R.*

Tubers cylindric. *Stems* twining, round, villous. *Leaves* opposite and alternate, cordate, five-nerved. *Male spikes* crowded, pendulous.

Beng. Kookoor aloo.

This species I have found in its wild state in woods about Calcutta. Flowering time the close of the rains. Page Carey Ed.

Tubers columnar, in a looser soil perpendicular, in a hard one variously bent. *Stems* and *branches* twining up and over trees and bushes, perfectly round, and covered with short soft down. *Leaves* opposite and alternate, petioled, exactly cordate, entire, five-nerved, with many transverse veins between them, from four to six inches long, and from three to five broad. *Female spikes* axillary, erect, long, simple or compound, villous, with remote, small, green, villous flowers. *Calyx* as in the genus.

The root is not much esteemed, though eaten by the poor when hard pressed for food. In shape it agrees with that of *Rumphius's Ubium anguinum, vol.* v. *t.* 122. but the leaves differ much.

11. D. *nummularia. Willd.* iv. 792.

Tubers ligneous, irregular. *Stems* twining, perennial, prickly towards the base. *Leaves* opposite, cordate, five-nerved, very smooth on both sides.

Hind. and *Beng.* Shora-aloo.

This species I took for D. *oppositifolia* for some time, but on finding some old plants with the stems ligneous, and armed with numerous, sharp prickles, I was convinced it must be a very different species. It is a native of the forests about Calcutta. Flowering time the close of the rains.

Root tuberous, but small, and hidden by numerous strong fibres. *Stem* many fathoms long, twining, with the lower part ligneous and prickly, the rest round, and very smooth. *Leaves* toward the base of the stem alternate, all the rest opposite, petioled, cordate, five-nerved, very smooth on both sides, glossy on the upper surface. MALE. *Spikes*, or rather *panicles* axillary, very ramous, smooth. *Flowers* numerous, minute. FEMALE. *Spikes* less ramous than in the male, and often simple. *Flowers* few, large remote. III. 804

The root appears to be unfit for food.

12. D. *glabra.* R.

Tubers small, sub-fusiform. *Stems* herbaceous, twining, polished and flattened. *Leaves* opposite and alternate, oblong, cordate, acuminate, polished, and somewhat glaucous.

A native of Silhet.

13. D. *heterophylla.* R.

Herbaceous, twining. *Leaves* alternate, the inferior ones sagittate, the superior ones cordate, three or seven-nerved, fine-pointed. *Male spikes* simple.

A native of Pulo Pinang, and the Moluccas. One male plant flowered in this garden for the first time in October and November 1809, after it had been in it ten years.

14. D. *oppositifolia. Willd.* iv. 797.

Herbaceous, smooth. *Leaves* opposite, from cordate to ovate-lanceolate, acute, from three to seven-nerved. *Male flowers* panicled, the *female* ones spiked.

Teling. Ava-tenga-tiga.

A native of dry soil, amongst bushes, on the Coromandel coast. Flowering time the rainy season.

Root tuberous, perennial. *Stems* twining, slender, round, smooth, annual. *Leaves* opposite, petioled, oval, acute, waved, smooth, from three to seven-nerved. *Male flowers* very numerous on axillary panicles. *Female flowers* few, on axillary spikes.

The roots are eaten by the natives.

15. D. *tomentosa. Kön. Mss.* III. 805

Herbaceous; *tubers* irregularly oblong, twining, downy, slightly armed. *Leaves* alternate, ternate, downy; *male racemes* axillary, compound.

A native of the valleys amongst the mountains of the Circars. It appears during the rains, with the other species of this genus.

Root tuberous, perennial, in shape like the common yam. *Stems* twining, armed with a few inoffensive prickles, downy. *Leaves* alternate, ternate, downy, entire. *Petioles* downy, with an inoffensive prickle here and there. *Racemes* axillary, compound, several times longer than the leaves, downy; *spikelets* fascicled, short, closely surrounded with minute, downy flowers. *Bractes* minute, three to each flower. *Calyx* or *corol* six-leaved, expanding. *Stamens* six, shorter than the calyx.

I have not seen the female plant; the above description and the drawing, are from male plants reared in my own garden, at Samulkota. *Roots* succulent, and requiring less care in dressing than those of *Dioscorea triphylla.*

16. D. *dæmona. Roxb.*

Root tuberous, biennial. *Stems* annual, twining, armed. *Leaves* ternate; *leaflets* obovate-cuneate, three to five-nerved.

Ubium silvestre. *Rumph. Amb.* v. *t.* 127, is certainly this plant, while I refer D. *triphylla. Willd.* iv. 790. to *Tsjageri nuren. Rheed. Mal.* vii. *t.* 33. a plant well known to me, though I have not yet described nor figured it.

This very distinct species is a native of the Goruckpore forests, as well as of the Moluccas. Plants from both countries are now before me in the Botanic garden at Calcutta, where they thrive well, and blossom about the close of the rains. The root is dreadfully nauseous, even after it has been boiled.

Root biennial, tuberous, roundish, variously lobate, with numerous, small, firm fibres, issuing from every part. One of two years' growth, which grew in this garden, was rather more than a foot in diameter. *Stem* annual, twining to a very great extent, round, and arm- III. 806

Page Carey Ed. ed with numerous acute pricklets, otherwise smooth. *Leaves* long-petioled, ternate. *Leaflets*, the middle one cuneate, obovate, the lateral sub-semicordate, all are acute, entire, both sides villous while young, from three to five-nerved, various in size, the largest often a foot long, and six inches broad. *Petioles* slightly armed with small prickles, and like the leaves, villous while young. MALE. *Inflorescence; spikes* axillary, compound, drooping, sometimes leaf-bearing; the general length from six to eighteen inches. *Calyx.* The exterior three leaflets round and smaller than the inner three, which are ovate. FEMALE FLOWERS on a different plant. *Spikes* axillary, solitary, pendulous. *Flowers* remote. *Calyx* as in the male. *Germ* beneath, very large, three-sided, villous. *Styles* scarcely any. *Stigmas* three.

17. D. *pentaphylla. Willd.* iv. 789.

Tubers oblong. *Stems* herbaceous, twining, prickly. *Leaves* digitate, downy. *Male flowers* panicled, the *female* ones spiked.

Beng. Kanta-aloo.

Nuren-kelengu. *Rheed. Mal.* vii. *t.* 34. and 35.

This species I have only found in its wild state; though the root is large, white, and reckoned very wholesome and palatable, and eaten by the natives. Flowering time the rainy season.

MENISPERMUM. Schreb. gen. N. 1544.

MALE. *Calyx* six-leaved. *Corol* six-petalled. FEMALE. *Calyx* and *corol* as in the male. *Germs* three, or six, singly one-celled, one-seeded; *attachment* interior. *Berries* three, or six,
III. one-seeded. *Embryo* inverse and furnished with a perisperm.
807 1. M. *Columba. R.*

Herbaceous, twining, hairy. *Leaves* sub-rotund, five-lobed; *lobes* acuminate. *Male panicles* axillary, drooping. *Anthers* four-celled.

Columbo, &c. *Asiat. Res.* x. *p.* 385.

Radix Colomba. *M. M. Murray*, iii. 333.

A native of the east coast of Africa in the vicinity of Oiba and Mozambique. One male plant blossomed during the hot season of 1807 in the garden of the late Dr. James Anderson at Madras, and from it Dr. A. Berry took the description which is published in the tenth volume of the *Asiatic Researches.* A fresh offset from the root of that plant was obtained for the Botanic garden at Calcutta, where it was planted in August 1807, and now, August 1812, it remains perfectly fresh, but has never thrown out even a single bud, or shown any tendency to vegetate. However, in April of the same year 1812 Dr. Berry brought with him from the late Dr. Anderson's garden at Madras, the original root, and several of its offsets, which he presented to the Botanic garden. They were immediately put into the ground, and in the course of a couple of months they threw out their hairy, herbaceous shoots to an extent of several fathoms, and blossomed most abundantly during the rainy season. The whole, as they now appear, agree well with Dr. Berry's original description; only I should rather be inclined to call the inflorescence a drooping *panicle*, than a compound *raceme.* In the months of November and December the whole perished down to the root; which on examination, had not only gained considerably in size but each had thrown out, during the season, several pretty large, fusiform tubers, not unlike yellow carrots, the largest of them was eleven inches in circumference, and twenty inches long.

2. M. *Cocculus. Willd.* iv. 825. *Gært. Sem.* i. 219. *t.* 70.

III. Perennial, twining, scandent. *Leaves* cordate, base truncate, firm and lucid.
808 There is no figure in *Rumphius*, or in the *Hortus Malabaricus* that I can quote for this famous plant, nor indeed in any work known to me, except *Gærtner*, above quoted, and that extends only to the fruit. It is a native of Malabar, from thence seeds were sent to the Botanic Garden in 1807; at the close of 1812 the plants were sufficiently large to extend over a large mangoe tree, with a stout ligneous stem, as thick as a man's wrist, covered with deeply cracked, spongy, ash-coloured bark, that of the young shoots smooth and green. *Leaves* alternate very exactly cordate, entire apex obtuse, or emarginate, of a hard texture, lucid above, paler but no ways tomentose, or villous underneath, from four to twelve inches long, by from three to eight broad, I cannot say any thing of the natural character, as our plants have not yet blossomed.

3. M. *verrucosum. R. Fleming in Asiat. Res.* xi. 171.

Perennial, scandent, bark verrucose; *young shoots* polished. *Leaves* cordate, acuminate, entire, smooth. *Male racemes* from the naked branches, simple. *Nectarial* scales inserted on the filaments.

Funis felleus. *Rumph. Amb.* v. *p.* 82. *t.* 44. *f.* 1.

Mal. Putra-wali.

A native of Sumatra, as well as of the Moluccas. From the first mentioned place, Captain Wright brought some plants to Bengal, which he presented to this garden, where they thrive well, and blossom in February and March; but the whole have turned out to be male ones; the female has not yet been seen.

Stems and *branches* scandent, and twining, round, much warted. *Young shoots* round and smooth. The plants in two years spread themselves entirely over pretty large trees. When by accident, or otherwise, any of the stems or larger branches, are cut in two, long filiform roots
III. spring from the upper portion, let the distance be ever so great, which quickly descend to and
809 enter the earth; by this wonderful economy the perfectibility of the plant is soon restored. It is the same with *Menispermum cordifolium* and *tomentosum.* Such uncommon care has Na-

ture taken for the preservation of these plants, which must, no doubt, be intended for some purpose, of which we are probably still ignorant. Page Carey Ed.

Leaves remote, petioled, cordate, acuminate, entire, smooth on both sides; *lobes* large, and rounded; from four to six inches long, and from three to five broad. *Petioles* columnar, smooth, two thirds the length of the leaves. *Male racemes* one, two, three, or four from the germs of the fallen leaves, over the larger naked branches, simple, round, smooth. *Flowers* generally in pairs on their proper, slender, diverging pedicels; with a small, oval, fleshy bracte at their insertion. *Calyx* six-leaved; *leaflets* ovate, small. *Petals* six, cuneate, inserted on the outside of the filaments, a little above their base. *Filaments* six, expanding. *Anthers* four-sided.

The leaves, indeed the whole plant, is exceedingly bitter, and is employed by the Malays for the cure of intermittent fevers. Captain Wright who first brought it from Sumatra, said it was as powerful a febrifuge, as the Peruvian bark.

4. M. *fenestratum. Gært. Sem.* i. *p.* 219. *t.* 46. *f.* 5.

Shrubby, scandent. *Leaves* cordate, in young plants peltate, entire, from five to seven-nerved, downy underneath. *Inflorescence* in globular umbellets, from the larger woody branches. *Berries* covered with downy bark.

Cingalese synonyms, *Woniwol, venivel*, or *Bangwel-getta.*

A native of Ceylon, where it blossoms during the cool months of November and December; and the seeds ripen in May and June.

Trunk and *large branches* scandent, stout, thick, and ligneous. The wood of a deep, lively yellow colour, and of a pleasant bitter taste. *Leaves* alternate, petioled, cordate, entire, five or seven-nerved, smooth and shining above, very hoary underneath, sometimes acuminate, sometimes obtuse; generally from three to nine inches long, and from two to six broad. In young plants frequently peltate. *Petioles* shorter than the leaves, round, downy. *Female umbellets*, or heads, from the stout, naked, ligneous branches, several from the same bud, on thick, round, downy peduncles, of about an inch in length. *Flowers* numerous, sub-sessile, villous, of an obscure green. *Bractes* of the umbellets obscure; those of the flowers three or four, reniform, villous, pressing close on the calyx. *Calyx* six-leaved; the three exterior ones oval, small, very downy on the outside, permanent; the three interior ones considerably longer. *Petals*, six small, short, sterile filaments, three embracing the base of the germs, very downy. *Styles* slender, recurved. *Berries*, from one to three come to maturity, nearly round, villous, of the size of a large filbert, each with a single seed, as represented by that excellent and accurate Botanist Gærtner. *Receptacle* of the fruit; while in blossom the flowers are nearly sessile, on a globular receptacle, of the flowers I will call it, but, like the germs in *Uvaria*, as the fruit advances in size, the very short pedicel of the original flower lengthens into a pretty long, stout, cylindric, villous pedicel, ending in a round-headed receptacle, on which sit from one to three berries surrounded with the small permanent calyx and corol. III. 810

The above description was taken from specimens sent to me from Ceylon by General Macdowall, who at the same time gave me the following account of the plant.

"I have lately been at some trouble to discover whether, or not the true *Colombo root* is a native of our soil, and shall probably remain in doubt, until I am furnished with your opinion. I now forward a specimen of the root, and some of the leaves, and flowers, which grow from the stem of the branch. It is a very strong creeper, and the natives make use of it to tie their cattle, and for other purposes of husbandry, where ropes are necessary. III.

"Should this prove the celebrated *Colombo root*, I believe a great quantity of it might be collected, and sent to Europe where it is in great request, but I can scarcely presume to think after all the labour of the learned Thunberg in particular, who denies its existence here, that I shall be so fortunate as to discover it. Your opinion shall be decisive with me, and although it may not be that valuable medicine, I suppose it yet may possess many excellent qualities. It is called by the Cingalese Venivel-getta, or Bangwel-getta. English, the knotted plant. It is in repute amongst the inhabitants, who slice it into pieces, and after having steeped it in water several hours swallow it with the liquid. They recommend it as an excellent stomachic. 811

"When the seed ripens, I shall have the pleasure of sending you some of it at all events.

"I have sent you a pretty large bit of the root, sawed from the centre of a knot, that you, may make an experiment upon it."

Note. This is certainly not the *Colombo root* of our *Materia Medica. R.*

5. M. *cordifolium. Willd.* iv. *p.* 826.

Twining with corky, scabrous bark. *Leaves* round, cordate, smooth.

Cit-amerdu. *Rheed. Mal.* vii. *t.* 21.

Beng. and *Hind.* Goluncha-luta.

Teling. Tippa tiga.

Is one of the most common wild plants in India, every hedge producing it in abundance, and every soil seeming to suit it perfectly well. It flowers most part of the year.

Root large, soft and spongy like the China root of the *Materia Medica.*

Stem twining, perennial, very succulent, running over the highest trees. *Bark* thick, corky, with many elevated scabrous specks, from the branches there frequently drop filiform fibres, which continue lengthening till they enter the ground, and form additional stems and roots. I have measured them thirty feet long, and in no part thicker than a pack-thread. III. 812

Leaves alternate, petioled, broad-cordate, five-nerved, entire, curved, smooth, about four inches each way. *Petioles* round, smooth, swelled at the base. *Racemes* axillary, or terminal, or from the tuberosities of former leaves, with frequently a few flowers in separate axills,

Page Carey Ed. *Flowers* numerous, small, yellow. MALE. *Calyx* six leaved; *leaflets* oval. *Petals* six, wedge-formed, half the length of the calyx; *margins* inflected and embracing the filaments. *Filaments* six, clubbed, spreading, rather longer than the petals. *Anthers* twin, immersed in the fleshy extremities of the filaments. FEMALE. *Calyx* and *corol* as in the male. *Filaments* six, fleshy, sterile. *Germs* three, superior, resting on a tumid receptacle. *Style* single, very short. *Stigmas* torn. *Berries* one, two, or three, generally one or two, rarely all the three come to maturity, of the size of a small cherry, smooth, red, succulent, with very glutinous pulp, each resting on a tumid receptacle. *Seed* single, kidney-formed, on the inside there is a deep pit, which receives its receptacle.

The fresh root is employed by the natives, in substance, mixed up with sour rice-gruel, and sweetened with sugar, for the cure of heat of urine in gonorrhœa. Birds eat the ripe berries. The seeds are not used in these parts for any purpose that I can discover. To intoxicate fish, and render them easily caught, the natives employ the fruit of *Gardenia dumetorum*, the bark of *Walsura*, and *Phyllanthus virosus*.

6. M. *villosum. R.*

Twining, every part soft with down. *Leaves* broad-cordate, five-nerved, entire. *Panicles* axillary, sub-globular.

A large twining perennial; a native of Chittagong, in flower and fruit at different times of the year. The six anthers are of two large round lobes each, with round pores at the top. *Nectarial scales* or rather *petals* sub-cuneiform, fleshy, and emarginate.

III. 813

7. M. *tomentosum. Roxb.*

Perennial, twining. *Leaves* three-lobed, tomentose. *Racemes* axillary; *petals* entire.

Beng. Pudma-goluncha.

A native of hedges, and thickets, all over Bengal, but by no means common. Flowering time the months of February and March; the seed ripens in May and June.

Stems twining up and over trees to a great extent. *Bark* of the older parts ash-coloured, with small, scabrous specks, that of the young shoots downy. Like some other species of this genus, viz. M. *cordifolium, Willd.* and *verrucosum*, Funis felleus, *Rump. Amb. v. t.* 44. *f.* 1. tender filaments issue from various parts, which quickly descend into the ground, often from the height of some fathoms. This happens particularly, when the lower part of the original plant has been destroyed, the succulent fragments remaining amongst the branches of the trees they run on, send out those fibres abundantly, some one, or more of which soon replaces the former stem and root. A most wonderful economy for the preservation of these plants. *Leaves* alternate, petioled, of a roundish cordate shape, having the anterior margin generally three-lobed, soft and tomentose on both sides, particularly underneath, from three to five or six inches long, and nearly as broad. *Petioles* round, tomentose, nearly as long as the leaves. *Style* scarcely any. *Stigmas* with enlarged, ragged surfaces and margins. *Berries*, or *drupes*, nearly round, smooth, of the size of a marrowfat pea, from one to three together, when ripe of a deep orange colour. *Seed* solitary, rough, reniform, with a pit on the inside, and a furrowed belt round the exterior or convex side. MALE. *Racemes* generally simple, one, two, or more together from the buds at the axills of the fallen leaves. *Bractes* minute, caducous, many-flowered. *Calyx*, the exterior three leaflets lanceolate, very small; the interior three nearly round, first expanding, then recurved. *Petals* oval, entire, with the posterior margins incurved over the base of the filaments. *Filaments* clavate. *Anthers* two-lobed. *Pistil* none. FEMALE FLOWERS on a different plant. *Calyx*, the three exterior leaflets minute; and the three interior ones roundish, many times larger than the former. *Petals* six, ovate-oblong, entire. *Stamens* none, but six, short, fleshy filaments, scarcely half so long as the petals. *Germs* three, elevated on a hemispheric receptacle. *Berries* as in the former species.

III. 814

It differs from Thunberg's *Menispermum trilobum*, in having the petals or scales of the nectary entire, and the interior three calycine leaflets spreading; whereas in M. *tribolum*, the former are said to be split at the apex, and the corol campanulate.

8. M. *hirsutum. Willd.* iv. *p.* 829.

Shrubby, twining, from broad-cordate, to linear-cordate, downy. *Male flowers* racemed; *female* axillary, solitary.

Hind. Hier or Dier.

Wal-tiedde. *Gært. Sem.* ii. *t.* 180.

This is the only species I have yet met with, that I can compare with M. *myosotoides*. Can they be the same?

Cocculus indicus foliis aristolocheæ subtus lanuginosis, fructu minore. *Pluk. Alma.* 61. *t.* 384. *f.* 5. agrees better with my plant than either *fig.* 7 or 3. of the same table.

Teling. Doosra tiga.

A common twining species, found in most hedges. It flowers during the wet season.

Stem woody, but slender, and twining. *Leaves* alternate, short-petioled, narrow-cordate, or ovate, three-nerved, covered with much soft down, about one or two inches long, and broad in proportion. MALE. *Racemes* terminal, filiform, interrupted, leafy. *Calyx* six-leaved. *Petals* six, linear, emarginate. *Stamens* as in M. *cordifolium*, only shorter. FEMALE. *Peduncles* solitary, one-flowered. *Calyx* and *corol* as in the male. *Germs* three, each semi-ovate, one-celled, containing one ovulum attached to the middle of the inside of the cell. *Berries* from one to three, one most common, nearly round, of the size of a small pea, marked on the inside near the base with the remaining stigma, smooth, when ripe of a black purple, and full of deep purple juice. *Seed* solitary, nuciform, forming nearly a complete ring with the joining on the inner and under side, between the stigma, and insertion of the peduncle. *Integuments* three; the *exterior* one rugose, and consisting of four valves, which fall off spontaneously in as

III. 815

many portions, if the pulp has previously been removed, if not, they adhere to it, and are separated with it in the dry state, exposing the middle, white, rugose, two-valved, nuciform tunic, which has a large perforation in the middle; the *inner* one very thin, and adhering to the perisperm. *Perisperm* conform to the seed, and of a light brown colour. *Embryo* inverse, annular. *Cotyledons* two, lanceolate. *Radicle* curved, with its apex opposite to the stigma. Page Carey Ed.

The juice of the ripe berries makes a good, durable, bluish purple ink. A decoction of the fresh roots, with a few heads of long pepper, in goats' milk, is administered for rheumatic and old venereal pains; half a pint every morning is the dose. It is reckoned heating, laxative, and sudorific.

The fresh leaves taste simply herbaceous. Rubbed in water they thicken it into a green jelly, which is sweetened with sugar, and drank when fresh made, to the quantity of half a pint, twice a day for the cure of heat of urine in gonorrhoeas. If suffered to stand a few minutes, the gelatinous or mucilaginous parts separate, contract and float in the centre, leaving the water clear like Madeira wine, and almost tasteless. Curry is made of the leaves, for people under a course of the roots, or jelly of the leaves. Goats, cows, and buffaloes eat it.

9. M. *laurifolium. R.*

Arboreous. *Leaves* lanceolar, lucid, entire, three-nerved. *Male* and *female flowers* on compound, axillary racemes.

Beng. Pudma-goluncha. III.

Found by Captain Hardwicke, in the vicinity of Dosa, in his journey to Shreenagur, in flower in April. 816

10. M. *hexagynum. R.*

Twining, villous. *Leaves* parabolic. *Female panicles* axillary, and terminal; *flowers* with six germs, six bifid petals, and abortive stamina.

A native of China. In flower the whole year in the Botanic garden. Except *laurifolium*, which is arboreous, the whole of the foregoing species are permanent, scandent or twining plants, of very considerable extent.

11. M. *triandrum. R.*

Shrubby, twining. *Leaves* ovate, oblong, pointed, smooth. *Male flowers* triandrous, with an urceolate, three-petalled corol.

A native of Pulo Pinang; seed sent from thence, produced one *male plant* in this garden, which is now ten years old, and blossoms during the rains. The *female plant* has not yet been seen.

Stem none, but many twining, or spreading branches, with smaller flower-bearing ones from their base near the ground, smooth, of a deep green in every part. *Leaves* alternate, short-petioled, ovate-oblong, pointed, entire, smooth on both sides; from two to three inches long. MALE. *Racemes* axillary, one or more together, rather longer than the petioles. *Flowers* numerous, very minute, yellow. *Calyx* six-leaved, the exterior ones minute, the interior three pitcher-shaped. *Filaments* three, wedge-shaped, thick and fleshy, erect, converging. *Anthers*, two pits in the apex of each filament.

12. M. *polycarpon. R.*

Shrubby, twining to a great extent. *Leaves* cordate, ovate, smooth. *Berries* as many as twelve, short-pedicelled.

Hind. Baga-mushada.

Beng. Tiliakora. III.

Teling. Tiga-mushadee. 817

A large, twining, woody shrub, found in most parts of the coast of Coromandel, and in Bengal, though not abundantly. It grows chiefly in hedges, and in places overrun with bushes. It flowers most part of the year.

Stem woody, twining to a great extent. *Bark* ash-coloured. *Leaves* alternate, petioled, cordate, pointed, smooth, shining, and frequently scolloped, about five inches long, and three broad. *Racemes* axillary, erect, in the male frequently compound, in the female simple, erect, bearing but few flowers. *Bractes* minute, caducous. *Flowers* small, yellow. MALE. *Calyx* nine-leaved; the three exterior ones small. *Petals* six, obcordate, clawed, about the size of the calyx. *Filaments* six, subulate, erect, alternately shorter, of the length of the corol. *Anthers* oval. FEMALE. *Calyx* and *corol* as in the male. *Germs* superior, about twelve in a circle, each ending in a short, subulate style. Stigmas simple. *Drupes* or *berries* many, short-pedicelled, ovate, smooth, red, about the size of a French bean. *Nut* one, or two celled.

Birds eat the berries. Cattle eat no part of it.

This is the third sort of *Mushadee* of the Telingas.

The first is Mushadee, *Nux vomica* tree. The second is *Naga Mushadee*, or snake wood tree, both already described; the root of this sort is also used for the cure of the bites of venomous snakes. It is rubbed between two stones, and given as a drink, mixed with water. However, the natives themselves confess they have very little opinion of its virtues.

13. M. *heteroclitum. R.*

Shrubby, twining. *Leaves* cordate. *Male flowers* panicled, monadelphous. *Calyx* two-leaved, corol six-petalled.

A native of the Circars.

Stem thick, woody, twining or climbing. *Bark* cracked, ash-coloured. *Leaves* alternate, petioled, cordate, entire, above smooth, of a deep shining green, whitish below, three or five-nerved, from four to six inches each way, with many small distinct tufts of hair upon the nerves on the under side. *Petioles* round, smooth, as long as the leaves. *Panicles* from the naked woody parts of the stem, and large branches, drooping beautifully. *Bractes* three- III. 818

Page Carey Ed. fold, one-flowered, small, caducous. MALE. *Calyx* two-leaved; *leaflets* opposite, oval. *Petals* six; the three interior ones equal, oval. *Stamens*, in the centre is a short thick column, supporting a great number of anthers, in the form of a globe. FEMALE. *Calyx* and *corol* as in the male. The rest as in M. *cordifolium*. The female flowers have not been found. *Berries* as in the genus, about the size and colour of a ripe black cherry, and as they are collected in very large, pendulous bunches, their appearance is inviting, but their taste is most abominable.

DIOECIA ENNEANDRIA.

TETRANTHERA. (Tomex. Thunb.)

Nat. ord. Lauri. Juss.

Involucre four or five-leaved, few-flowered. MALE. *Calyx* one-leaved, entire, or from three to six-parted. *Corol* none. *Nectarial glands* various. *Anthers* four-celled. FEMALE. *Germ* superior, one-celled, one-seeded, superior. *Berries* one-seeded. *Embryo* inverse, without perisperm.

1. T. *nitida. R.*

Leaves short-petioled, sub-cuneiform, obtuse, shining. *Racemes* axillary, short. *Involucre* four-leaved, five-flowered. *Calyx* from three to six-cleft. *Nectary*, in the female corollets, alternately sagittate-cordate, and subulate. *Male* enneandrous. *Berries* oblong.

Kintoni-jam is the vernacular name in the neighbourhood of Silhet, where it is indi-
III. genuous, and grows to be a useful timber tree, of very great size, and in the more remote
819 forests which cover the Garrow hills, so large as to admit of being made into canoes of full fifty feet in length, for which purpose this tree is preferred. Flowering time July and August; the seed ripens in April.

Young shoots smooth and glossy. *Leaves* alternate, short-petioled, of a lanceolar, cuneiform shape, obtuse, entire, firm and glossy, from five to eight inches long, and two broad. *Racemes* axillary, and from the leafless branchlets of the former year, short, few-flowered. *Pedicels* alternate, each ending in a minute umbellet of five corollets, embraced by an involucre of four, or rarely five, round, concave, smooth leaflets. *Calyx* with a hairy campanulate base, and six-parted border. *Corol* none. MALE. *Filaments* generally longer than the calyx, woolly, and disposed as in the *Lauri*. *Nectarial glands* alternate with the stamina, pedicelled, headed, and woolly. *Germ* none. FEMALE. *Nectarial bodies* alternately broad-cordate-sagittate, and subulate, but very irregular in shape and number. *Stamina* none. *Germ* superior, embraced by the bell of the calyx, one-celled; ovulum single, attached to the top of the cell. *Style* the length of the calyx. *Stigma* simple. *Berries* oblong, smooth, succulent, of the size and appearance of those of *Laurus Cinnamonum*, one-celled. *Seed* simple, long-ovate. *Integuments* two; the *exterior* one light brown, and of the texture of parchment; the *inner* one membranaceous. *Perisperm* none. *Embryo* inverse, as in the *Lauri*.

2. T. *apetala. Corom. pl.* ii. *N.* 147.

Leaves from oval to lanceolate. *Involucres* four-leaved, from eight to twelve-flowered. *Calyx* scarcely any. *Stamens* about fourteen.

Tomex sebifera. Willd. ii. *p.* 840.

Gaja-pippali. *Asiat. Res.* iv. *p.* 303.

Laurus *involucrata. Konig's Mss.* and *Retz. Obs.* vi. *p.* 27.

Sebifera *glutinosa. Lourier. Cochin Ch.* 783.

III *Teling.* Narra-alagi.

820 *Beng.* Kookoor chita.

This grows to be a middle sized tree, is a native of the mountainous parts of the Circars. *Flowers* in June, when the rains begin.

Leaves scattered near the extremities of the branchlets, petioled, oval, obtuse, smooth, above shining, from three to five inches long, and from two to three broad. *Petioles* about an inch long, round, smooth. *Stipules* none. *Peduncles* solitary, axillary, as long as the petioles, three or four-cleft.* *Pedicels* rather shorter than the peduncles, clubbed, each supporting a small head or umbellet of minute flowers. *Bractes*, a small one at the insertion of each pedicel. MALE. *Involucre* four-leaved, containing from eight to twelve pedicelled corollets. *Leaflets* orbicular, concave, caducous. *Perianth* none. *Calyx* campanulate; *border* an exterior rim into which the stamina and nectarial glands which surround the germ are inserted. *Anthers* four-lobed, four-celled, with an oval lid to each cell. *Nectarial glands* from six to sixteen, short-pedicelled, oval, peltate, alternate with the filaments, but three times shorter. *Germ* none, or small, and abortive. FEMALE FLOWERS on a separate tree. *Umbellets*, *involucre* and *calyx* as in the male. *Stamens*, the hairy filaments, but instead of anthers there are oblong white glands. *Nectarial glands* as in the male. *Germ* superior, globular, one-celled, containing one ovulum attached to the top of the cell, as in the *Lauri*, to which order it belongs. *Style* twice the length of the filaments. *Stigma* torn. *Berry* globular, smooth, black when ripe, and almost dry, one-celled, of the size of a pea, resting on the clubbed pedicel, as on a cup like the acorn. *Seed* one, globular. *Embryo* inverse, and without perisperm, as in the *Lauri*.

* In Bengal, where the tree is common, and its growth luxuriant, the peduncles in the male tree are numerous about the ends of the branchlets, and frequently racemed, bearing from ten to fifteen flowers.

Note. Dr. Berry of Madras informs me that this is the tree which Dr. Klein of Tranquebar named after him, (*Berrya Chinensis. Willd. ed. sp. pl.* ii. 840.) 821

3. T. *Monopetala. R. Corom. pl.* ii. *N.* 148.

Leaves oblong, downy underneath. *Involucres* five-leaved, five to six-flowered. *Calyx* five-cleft.

Beng. Bura Kookoor chita.

Teling. Nara mamoodee.

Tomex *japonica. Thunb. Jap.* 190. *Willd.* ii. 839.

Kutmoreea, and Pupreea. *Asiat. Res.* vi. *p.* 377-8.

Apetala and *monopetala* are both small, handsome, evergreen trees; common on the coast of Coromandel, and Bengal, flowering in May and June.

4. T. *quadriflora. R.*

Leaves lanceolar, smooth. *Peduncles* axillary, few, long and distinct; *involucre* four-leaved, four-flowered; *corollets* enneandrous; *calyx* six-parted. *Berries* ovate-oblong.

Sowaree, the vernacular name in the Silhet district, where it is indigenous in the extensive forests which skirt the Garrow hills, and there grows to be a small, ramous tree; blossoming about the end of the cool season in February, and the seed ripening during the rains. It differs from *lanceæfolia* in the *umbellets* being fewer, and long-peduncled; in that they are sub-sessile and crowded. *Branches* and *branchlets* smooth, straight, and spreading but little. *Leaves* alternate, petioled, lanceolar, entire, smooth on both sides, glaucous underneath; from four to six inches long, by one or two broad. *Petioles* about an inch long, smooth, slightly channelled. MALE. *Umbellets* axillary, generally from six to eight in the same axills, long-peduncled. *Peduncles* villous. *Involucre* four-leaved, four-flowered; *leaflets* oval, concave, five-nerved, villous. *Calyx* from five to six-parted, six is the most frequent; *segments* oblong, alternate, rather larger, villous. *Corol* none, except the *calyx* be so called. *Filaments* III. generally nine, longer than the petals, villous, arranged exactly as in the *Lauri*, viz. a ver- 822 tical pair under the three larger exterior segments of the calyx, with two large sub-pedicelled glands on the base of the lower three, and a single unappendaged one between the three hairs, on the base of the three smaller and inner segments of the calyx. *Anthers* four-celled. *Germ* an abortive column, with a larger three-lobed apex. FEMALE. *Umbellets, involucre,* and calyx as in the male. *Berries* of the size and shape of a very small olive, and much like those of the cinnamon, resting on the permanent base of the calyx, one-celled. *Seed* solitary, of the shape of the berry. *Perisperm* none. *Embryo* inverse, as in the other *Lauri.*

5. T. *macrophylla. R.*

Arboreous. *Leaves* oval, villous underneath. *Umbellets* in lateral and axillary fascicles; *involucres* from four to six-flowered; *corollets* decandrous; *calyx* six-parted. *Berries* oblong.

Sooria, the vernacular name in the Silhet district, where it grows to be a middling sized, very ramous, ever-green tree; on its leaves the *Mugadootee* silk-worm feeds. Flowering time, the hot season, chiefly April; the seed ripens in August.

6. T. *lanceæfolia. Roxb.*

Shrubby. *Leaves* lanceolar, entire, glossy, glaucous underneath. *Umbellets* axillary, and lateral, crowded, sub-sessile. *Involucre* four-leaved, from four to five-flowered. *Corollets* enneandrous. *Calyx* six-parted. *Berries* oblong.

Bun-mool, the vernacular name in Silhet, where the shrub is indigenous in the forests. Flowering time March and April; and the seed ripens in June.

Young shoots smooth. *Leaves* alternate, short-petioled, lanceolar, entire, one-nerved, glossy III. above, glaucous underneath; from three to four inches long, by one broad. *Stipules* none. 823 MALE. *Umbellets* axillary, but chiefly under the leaves from the old axils, crowded, short-peduncled, but appearing in sessile heads, many being crowded together, small, of a dull yellow. *Involucre* four-leaved, from four to five-flowered; *leaflets* round, concave. *Calyx* or *perianth proper* one-leaved, six-parted, exactly as in *Laurus. Filaments* nine exterior, and simple, from the base of the segments of the calyx, and three interior, or rather inferior, from its tube; these have the glands of the *Lauri;* all are hairy. *Anthers* four-celled. *Germ* none. FEMALE. *Umbellets* as in the male. *Berries* oblong, of the size of a field bean, black, smooth, succulent, one-celled, seed solitary, conform to the berry. *Perisperm* one. *Embryo* inverse. *Cotyledons* conform to the seed. *Radicle* superior, and considerably within the apex of the cotyledons.

7. T. *laurifolia. Jacq. Hort. Schoenb.* i. *p.* 59. *t.* 113.

Leaves cuneate, obovate, obtuse, smooth.

Tomex *Tetranthera. Willd.* iv. 839.

A small tree, a native of Bengal. It blossoms in May and June, and the seed ripens about the close of the rains.

8. T. *fruticosa. R.*

Shrubby. *Leaves* lanceolar, glossy, and glaucous underneath. *Racemes* axillary, and lateral. *Involucre* four-leaved, five-flowered; *corollets* enneandrous, with a six-cleft calyx. *Berries* oblate.

Oaoa, the vernacular name in Silhet, where it is found. It is an upright ramous shrub, of about six feet in height, growing in the forests, where it flowers in June and July, and the berries ripen the ensuing cool season.

Leaves alternate, short-petioled, lanceolar, firm, and glossy, glaucous underneath; from six or twelve inches long, by three or four inches broad. MALE. *Racemes* axillary, and solitary, III. or more numerous from the former year's branchlets below the leaves; a little umbellet of five 824 minute florets in a four-leaved involucre. *Bractes* lanceolate, downy, caducous, one under each

Page Carey Ed. pedicel. *Calyx* proper, six-cleft, exactly as in the *Lauri*. *Corol* none. *Stamina* also as in that order, only there are no glands alternate with the lower and inner three. *Germ*, a slender, abortive column. FEMALE. *Racemes, umbellets*, and *involucre* as in the male, but shorter. *Calyx* as in the male, but the segments are deciduous, and the base, or undivided part, permanent. *Germ*, as in the other species already described. *Berries* of the size of a pea, rather oblate, smooth, shining, of a dark purple when ripe, one-celled. *Seed* solitary, conform to the berry. *Integument* single. *Embryo* inverse, no perisperm.

9. T. *pentandra. R.*

Leaves lanceolar, triple-nerved, smooth; *umbellets* axillary; *involucres* four-leaved, five-flowered; *corollets* pentandrous.

Teling. Nara.

Laurus involucrata. *Corom. pl.* ii. *N.* 187.

A middling sized tree, a native of the Circar mountains; where it blossoms in the cold season, and the seed ripens in April. Every part smells strongly of camphor.

DIOECIA DECANDRIA.

CARICA. Schreb. gen. N. 1536.

MALE. *Calyx* scarcely any. *Corol* five-cleft, funnel-shaped. *Filaments* on the tube of the corol, alternately shorter. FEMALE. *Calyx* five-toothed. *Corol* five-petalled. *Stigmas* five. *Berry* one-celled, many-seeded.

C. *papaya. Willd.* iv. 814.

Lobes of the leaves sinuous.

Papaja. *Rumph. Amb.* i. *t.* 50.

III. *Beng.* Papeya.

825 Papaw tree of the English.

The description of this plant in the *Genera Plantarum* is perfectly exact. It is cultivated in gardens all over India, for the sake of its fruit, which is used both green and ripe. When green they are used in curries by the natives, also pickled and made into a preserve. When ripe the interior, soft, yellow pulpy part is generally eaten without the addition of pepper and sugar, as in the West Indies; many like them much, and they are esteemed innocent and wholesome. It is likely that in this country they may be of a superior quality to those of the West Indies.

I made some experiments in the years 1790 and 1791, to determine whether the female would bear, and ripen its fruit without the male, for which I reared a number of young trees in a garden situate at least a mile and a half from any other Papaw tree; as soon as they showed their flower buds, I could easily distinguish the male, and destroyed them all; nine females were left. They grew most luxuriantly, being in a good soil and well watered, blossomed as usual, and the fruit grew till it was about half the usual size; then or before they uniformly fell off without appearing to have more than the rudiments of seeds. In this manner they continued to blossom and produce half-grown fruit for fully one year, without producing one that came to maturity. I was then perfectly satisfied with the success of my experiment, and caused some male plants to be planted among them; as soon as they had flowered, my female plants began to produce large ripe fruit, their seeds came to the usual maturity, and grew readily.

The Linnæan sexual system did not want additional proofs of its being established on the most solid foundation, otherwise the above related experiment is a very strong one. I know of no tree, or plant, so well adapted, to ascertain the necessity of the male being so

III. situate, as to insure the influence of its flowers on those of the female, to render them

826 fertile. Since writing the above Major Wynch informed me that when he commanded at Chicacole there were in his garden two female trees that bore abundantly; there was one male tree standing between them; he had often heard that the female tree would not bear without the male, but did not entirely credit the report. To satisfy himself he cut down the male tree and there was no other near, he thinks not within a mile or two; the consequence was, that from that time neither of the female trees produced ripe fruit, except the few that he thinks might have been formed before he cut down the male tree. December 1793, some specimens of a male tree with fruit on them, were shown me by Sir William Jones, I have not seen the tree, and it is the only instance that has come to my knowledge, where female or hermaphrodite flowers were found on the male Papaya tree. 1609. Since writing the last paragraph another instance of the male tree producing fruit occurred in the Botanic garden. I am informed that the same is common at Malacca.

DIOECIA ICOSANDRIA.

ROTTLERA. R.

MALE. *Calyx* from two to five-parted. *Corol* none. FEMALE. *Calyx* from four to five-cleft. *Corol* none. *Germ* superior, from two to four-celled; *cells* one-seeded; *attachment* interior. *Capsules* from two to four-coccous. *Embryo* inverse and furnished with a perisperm.

1. R. *tetracocca. R.* Page Carey Ed.

Young shoots ferruginous. *Leaves* long-petioled, cordate, rarely lobate, acuminate, hoary underneath. *Panicle* terminal. *Capsules* hoary, papillose, tetracoccous.

Marleya is the vernacular name in the Silhet district, where it grows to be a useful timber tree, of considerable size. It flowers in April and May; and the seeds ripen in August. III. 827

Young shoots densely clothed with stellate pubescence, which is at first ferruginous, but by age gets hoary. *Leaves* alternate, long-petioled, cordate, tending to be peltate in young plants, rarely lobate, generally a little repand, acuminate, when young somewhat ferruginous, when full-grown smooth of a deep green above, and hoary underneath, with two flat oblong glands at the base, from six to twelve inches long, and from four to eight broad. *Stipules* minute. *Panicles* terminal, *male* and *female* ones on distinct trees, composed of several simple branches, which in the male are much longer. MALE FLOWERS numerous, small, collected in small sessile heads over the branches of the panicles. FEMALE FLOWERS larger, and distinct. *Calyx* in both four or five-parted. *Corol* none. *Filaments* in the male very numerous. *Anthers* twin, in the female none. *Germ* roundish, generally four-celled, each cell containing a single ovulum, attached to the top of the axis. *Styles*, or *stigmas* four, or one for each cell of the germ, spreading, brown and shaggy. *Capsule* of the size of a small gooseberry, a little flattened, hoary, and papillose, generally four-celled, four-valved. *Seed* solitary; the *exterior* integuments smooth, of a shining black, thick and hard. *Perisperm* and *embryo* as in the order *Euphorbiæ*.

2. R. *tinctoria. Willd.* iv. 823. *R. Corom. pl. vol.* ii. *No.* 168.

Arboreous. *Leaves* alternate, ovate-oblong, three-nerved, with two glands at the base. *Panicles* axillary and terminal. *Capsules* tricoccous, covered with coloured farina.

Sans. and *Beng.* Poonnag.

Teling. Wusuntagundha or vusuntagundha.

Ponnagam. *Rheed. Mal.* v. *t.* 21.

A native of Coromandel. Flowers in the cold season.

The red mealy powder, which covers the capsules is used by the natives to dye scarlet, and in Bengal the root is said to dye red also.

Compare with *Croton coccineum. Willd.* iv. 544. III.

3. R. *peltata. R.* 828

Arboreous. *Leaves* long-petioled, cordate, peltate, acuminate, downy. *Racemes* terminal, and lateral, solitary. *Capsules* covered with villous filaments.

Seergoollua, the vernacular name in Silhet, where it grows to be a middling sized tree. It flowers in April and May, and the seed ripens in August.

Young shoots clothed with much pretty long, soft, light gray, diverging pubescence. *Leaves* alternate, long-petioled, sub-cordate, peltate, long ensiform-pointed, three-nerved, downy on both sides; from four to eight inches long, by three to six broad. *Stipules* subulate, villous. *Racemes* terminal, and lateral, solitary, simple, longer than the leaves, male and female alike in form and size, but on different trees. *Calyx* in both four or five-cleft; *segments* lanceolate, downy. *Corol* none. *Stamina* in the male numerous; in the female none. *Germ* three-lobed, filamentose, three-celled; *ovula* solitary, attached to the middle of the axis. *Styles* three-fourths three-cleft, segments hairy. *Stigmas* simple. *Capsules* depressed, three-lobed, of the size of a small gooseberry, covered with pretty long, hairy filaments, three-celled, six-valved, opening from the apex. *Seed* solitary, globular, of the size of a grain of black pepper. *Integuments* single, hard, pretty thick, but brittle, of a chesnut-brown colour, and highly polished. *Perisperm* conform to the seed, white, hard and waxy. *Embryo* transverse. *Cotyledons* two, oval, three-nerved. *Radicle* on the outside, opposite to the umbilicus, or attachment of the seed to the upper end of the axis. This position differs from every other of this order *(Euphorbiæ)* of Jussieu, which I have yet examined.

4. *R. ferruginea. R.*

Arboreous. *Leaves* alternate, from cordate to deeply three-lobed, clothed with ferruginous, stellate pubescence underneath. *Panicles* terminal. *Capsules* tricoccous, villous.

Tanarius minor. *Rumph. Amb.* iii. *p.* 190.

Croton *gossypifolium, Vahl. Symb.* ii. 98. *t.* 49, is much like the male, and the female is labelled a *Ricinus* in the Banksian Herbarium.

A native of the Malay Islands. The male plant flowers during the hot season in the tanic garden at Calcutta.

5. *R. alba. R.*

Arboreous. *Leaves* alternate, long-petioled, cordate, somewhat peltate, and slightly sc lop-dentate, hoary underneath. *Panicles* terminal. *Capsules* villous, armed with villous ments.

A native of Prince of Wales' Island. It flowers in the Botanic garden during the r and the beginning of the cool season.

6. *R. dicocca. R.*

Scandent. *Leaves* round-cordate, alternate, three-nerved. *Racemes* terminal, and lary. *Capsules* dicoccous.

Aleurites *laccifera. Willd.* iv. 590.

Teling. Kanda-veltoo.

Hind. Akoos.

A native of various parts of India. It is a weak, though large, sub-scandent Flowering time the hot season; the seed ripens in the rainy season.

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7. *R. hexandria. R.*

Leaves alternate, long-petioled, rhomb-cordate, cuspidate. *Stipules* ensiform. *Male panicles* axillary, bearing heads of hexandrous flowers.

A native of the Malay Archipelago, and has a great deal of the habit of *Rottlera alba.*

GELONIUM. Gært.

III. 830 MALE. *Calyx* five-leaved. *Corol* none. FEMALE. *Calyx* five or six-leaved. *Corol* none. *Germ* superior, two or three-celled; *cells* one-seeded; *attachment* superior. *Capsule* two or three-celled. *Seeds* solitary, arilled. *Embryo* inverse, and furnished with a perisperm.

1. G. *bifarium. Willd.* iv. 831.

Leaves entire. *Capsule* two-celled. *Stamina* about fifteen.

Of this elegant small tree, I have only met with two in the Company's Botanic garden, one of them bears male, and the other female flowers, during the months of February and March. The buds are incrusted with yellow resin.

Trunk straight, as yet small. *Branches* numerous, spreading; *branchlets* bifarious, the whole forming a very regular, oval head. *Bark* of a very light ashcolour, and smooth; the height of the trees about thirty feet. *Leaves* alternate, short-petioled, bifarious, oblong, perfectly entire and very smooth on both sides, permanent. *Stipules* small, obtuse. *Flowers* small, yellow, several on a very short common peduncle opposite to the leaves, each supported by its own proper pedicel, in the male most numerous. *Bractes* some very small ones at the base of the pedicels, these as well as the stipules, flower-buds, and germs, have frequently small bits of a yellow resin adhering to them. MALE. *Calyx* five-leaved; *leaflets* unequal, orbicular, concave, permanent. *Corol* none. *Filaments* about five, as long as the calyx, inserted into a glandular, convex receptacle. *Anthers* oval, two-lobed. FEMALE FLOWERS on a different plant. *Calyx* as in the male, permanent. *Corol* none. *Nectary* a large, crenulated, yellow ring surrounding the base of the germ. *Germ* superior, two-lobed, two-celled, with one ovulum in each cell attached to the top of the axis. *Styles* scarcely any. *Stigma* four-lobed. *Capsule* dicoccous, fleshy, smooth, yellow, two-celled, two-valved. *Seeds* solitary, round, enveloped in an entire, juicy, white aril. *Integuments* besides the aril two; the *exterior* one brown, smooth, and brittle; the *inner* one membranaceous. *Perisperm* conform to the seed,
III. 831 pure white, amygdaline. *Embryo* inverse. *Cotyledons* often as large as the perisperm, round.

Note. This is nearly allied to Gærtner's *Gelonium cupanoides,* and I conjecture they must belong to one family. My *Suragada glabra,* now *Gelonium fasciculatum,* must, no doubt, be referred to the same genus.

2. G. *lanceolatum. Willd.* iv. 832.

Lanceolar, entire. *Flowers* crowded, but distinct. *Stamina* numerous. *Capsules* tricoccous.

A native of Bengal, where it grows to the size of a small, very ramous tree. It flowers during the hot season, in April and May chiefly. The seed ripens in the cool season.

Trunk straight to the top of the tree. *Branches* numerous down to the ground, diverging. *Branchlets* alternate, bifarious. *Bark* of the old, woody parts, ash-coloured, of the young shoots smooth, and green. *Leaves* alternate, bifarious, very short-petioled, lanceolar, obtuse, entire, though in young luxuriant plants they are sometimes serrate near the apex, of a firm texture, and polished on both sides; from one to six inches long, and about one-third as much in breadth. *Stipules* very short, reniform, resinous; when they fall a strong mark like an articulation is left. MALE FLOWERS pedicelled, many together, but distinct, leaf-opposed, small, yellow, delightfully fragrant. *Calyx* of five, unequal, oval, concave, sub-ciliate leaflets. *Corol* none. *Filaments* numerous, longer than the calyx, inserted on a hemispheric receptacle, their insertions intermixed with numerous yellow glands, with ragged apices. *Anthers* ovate, *pistillum* none. FEMALE FLOWERS short-pedicelled, crowded, opposite to the insertion of the leaves, small, of a greenish yellow. *Calyx* five-leaved. *Corol* none. *Nectary,* a yellow, five-lobed, membranous ring round the base of the germ. *Germ* round, three-celled, with one ovulum in each cell, attached to the top of the axis. *Style* none. *Stigmas* three, recurvate, bifid, and ragged. *Capsule* the size of a small cherry, rather fleshy, when ripe yellow, tricoccous. *Seeds* solitary, enveloped in a white, fetid aril. The other parts almost exactly as in the
III. 832 *Euphorbiæ,* viz. a fleshy perisperm and inverted embryo.

3. G. *fasciculatum. R.*

Leaves oblong, near the apex serrate. *Flowers* fascicled. *Capsules* tricoccous. *Stamina* numerous.

Hind. Bun naringa.

Teling. Soora gada.

This is rather a small tree, a native of the Circar mountains and Bengal. It flowers in March and April. The buds are covered with a transparent, soft, resinous exudation.

Leaves alternate, very short-petioled, oblong, entire, or serrate toward the apex, smooth, shining, firm, from four to six inches long, and about two broad. *Stipules* within the leaves, spathiform, as in the *Gardeniæ.* When they drop they leave a permanent circular mark. *Umbellets* leaf-opposed, few-flowered. *Flowers* yellow, very fragrant. *Bractes* small, caducous. MALE. *Calyx* five-leaved; *leaflets* spreading, orbicular, concave. *Corol* none. *Filaments* numerous, as long as the calyx, inserted into a yellow, glandular receptacle. FEMALE. *Calyx* six-leaved; *leaflets* obovate. *Corol* none. *Nectary,* a yellow, glandular, angular ring, surrounding the base of the germ. *Germ* superior, ovate, three-celled, with one ovulum in each attached to the top of the axis. *Capsule* nearly round, fleshy, yellow, smooth, three-celled

three-valved. *Seeds* solitary, attached by the inside of the apex of their soft fleshy aril, to the top of the axis, or receptacle. *Perisperm* white, and fleshy. *Embryo* inverse. *Cotyledons* round-cordate. *Radicle* superior. Page Carey Ed.

DIOECIA POLYANDRIA.

FLACOURTIA. Schreb. gen. N. 1546.

MALE. *Calyx* five-parted. FEMALE. *Calyx* as in the male. *Corol* none. *Germ* superior, five-celled. *Cells* two-seeded; *attachment* interior. *Berry* few-seeded. *Embryo* furnished with a perisperm, and centripetal radicle.

1. F. *inermis. Roxb.* III. 833

Arboreous, unarmed. *Leaves* oblong, crenate-serrate, polished. *Racemes* axillary, short. *Flowers* hermaphrodite. *Style* five-cleft.

Mal. Tomitomi.

A native of the Moluccas, where the tree is cultivated for its edible fruit. It has lately been introduced into the Botanic garden, where the tree thrives well, and blossoms during the dry season. The fruit ripens towards the close of the rains.

Trunk short, soon dividing into numerous branches which form a large, very dense head of great beauty. The *bark* smooth, brownish, and perfectly destitute of every thing like thorns or prickles. *Leaves* alternate, short-petioled, elliptic, smooth, of a shining green on both sides; when they first expand, reddish, and then the tree is uncommonly gaudy, from three to six inches long. *Petioles* semi-cylindric. *Stipules* none. *Racemes* axillary, longer than the petioles, few-flowered. *Pedicels* clavate, jointed near the middle. *Bractes* ovate, caducous. *Calyx* deeply four or five-parted; *divisions* reniform, shorter than the stamens and pistil. *Corol* none. *Filaments* about twenty, inserted on a fleshy nectariferous ring, which surrounds the base of the germ. *Anthers* two-lobed. *Germ* ovate, five-celled, with two ovula in each, attached to the middle of the axis. *Style* five-cleft, spreading. *Berry* of the size and appearance of a red cherry, and like that fruit, very smooth. *Seeds* as far as ten, in five vertical pairs, much compressed, ovate, covered with a rough nuciform integument. *Perisperm* conform to the seed. *Embryo* straight. *Cotyledons* ovate. *Radicle* oblong, pointing to the umbilicus, or pointed end of the seed, which is next to the middle of the axis of the fruit.

The fruit is too sour to be eaten raw, but makes very good tarts. The tree is of a middle size, very ornamental, and a perfect evergreen in Bengal.

2. F. *Ramontchi. Willd.* iv. 829. *L'Herit. Stirp.* 59. *t.* 30. III. 834

Shrubby, armed. *Leaves* oval, crenate. *Racemes* terminal.

A native of Madagascar, from the Isle of France it was brought to the Botanic garden, where it grows but very slowly, and has not yet flowered. Grafted on the other species, natives of India, they take readily but very slowly.

3. F. *cataphracta. Willd.* iv. 830.

Arboreous, thorns terribly decompound on the trunk; *branchlets* unarmed. *Leaves* ovate, oblong, serrulate. *Racemes* axillary, few-flowered.

Beng. Paniyala.

This species I found in the Company's Botanic garden, where it grows to be a pretty large tree; it was introduced about three years ago from the eastern frontier.

Trunk short, armed with innumerable, large, very ramous thorns. *Bark* brown, pretty smooth. *Branches* numerous, generally unarmed, except the lower parts of the largest next the trunk, and straight shoots, of which there are often many on them, while young they are cross-armed and simple. *Leaves* alternate, short-petioled, oblong, serrate, smooth, shining green on both sides, from two to three inches long. *Stipules* none. *Racemes* small, from five to ten-flowered, axillary, or from the germs of the old axills over the naked branchlets. *Bractes*, a small, cordate one below each pedicel. MALE. *Calyx* from four to five-parted, small. *Corol* none. *Filaments* numerous, as long as the calyx, inserted into a nectarial-looking, glandular, convex receptacle. *Anthers* small. FEMALE FLOWERS on a distinct tree. *Calyx* from four to six-leaved, or split to the base; *leaflets* spreading. *Corol* none. *Nectary* a glandular, lobate ring girding the base of the germ. *Germ* superior, round. *Style* short and thick. *Stigma* large, from four to six-parted, stellate. *Berry* of the size of a common plum, globular, smooth, purple, succulent, from eight to twelve-seeded, ten is the natural number when all come to maturity. The *berries* are palatable and reckoned wholesome. III. 835

4. T. *sepiaria. Willd.* iv. 831. *R. Corom. pl.* 1. *N.* 68.

Shrubby. *Thorns* simple, leaf and flower-bearing. *Leaves* oblong, obtuse, serrate, smooth. *Peduncles* axillary, and terminal. *Berries* about five-seeded.

Sideroxylon *spinosum. Willd.* i. 1091.

Teling. Kanroo.

Courou-moelli. *Rheed. Mal.* v. *t.* 39.

A small shrub, common on uncultivated land, in various parts of India.

5. T. *sapida. Willd.* iv. 830. *R. Corom. pl.* 1. *N.* 69.

Arboreous. *Thorns* axillary, simple. *Leaves* oval, serrate, smooth. *Peduncles* axillary, few-flowered. *Berries* from eight to ten-seeded.

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Sans. Swadoo-Kuntuka.
Beng. Bincha.
Teling. Pedda-Kanroo.
A native of Coromandel and Bengal, though by no means so common as *sepiaria*.
6. F. *obcordata. R.*
Shrubby, armed. *Leaves* obcordate, crenate. *Flowers* terminal. *Berries* ten-seeded.
A native of Chittagong.

CHAULMOOGRA. R.

MALE. *Calyx* from four to five-lobed. *Corol* five-petalled, with a nectarial scale under the base of each. FEMALE. *Calyx* and *corol* as in the male. *Germ* superior, one-celled; *ovæ* numerous on five parietal receptacles. *Styles* five. *Berry* dry, one-celled, many-seeded. *Embryo*
III. furnished with a perisperm; direction of the radicle various.
836 C. *odorata. R.*

Chaulmoogra and Petarkura, are the names of this tree, and the drug, hereafter mentioned, which it furnishes. It is indigenous in the Silhet district, and grows to a large size, equalling the largest Mango trees, and when full grown may be compared to the great Maple, or Sycamore, *Acer Pseudo-platanus*. It blossoms in April and May, and the seed ripens about the close of the year; when the fruit is gathered, the seed is carefully taken out, dried, and sold to the native dealers in drugs at about five Rupees the maund of eighty-four pounds.

Trunk and *large branches* covered with tolerably smooth, ash-coloured bark; the young shoots more or less declinate, round, smooth and green. Wood of a light brown colour, close-grained, and seemingly fit for a variety of purposes. *Leaves* short-petioled, alternate, bifarious drooping, lanceolate, entire, acuminate, smooth, from six to ten inches long, and from one and a half to two and a half broad. *Stipules* none. *Peduncles* from the sides of the ligneous branchlets of from one to several years' growth, generally several together, from one to two inches long, one-flowered. *Bractes* minute round the base of the peduncles. MALE FLOWERS an inch and a half in diameter, when expanded of a pale yellow, and powerfully fragrant. *Calyx* one-leaved, bowl-shaped; *border* from four to five-lobed. *Petals* five, sessile, oblong, inserted into the receptacle, round the filaments. *Nectary*, five ciliate, oblong scales, or smaller petals of a deeper yellow colour over the lower half of the proper petal, and attached to them. *Filaments* about a hundred, woody, inserted into the disk of the receptacle. *Anthers* linear, erect, about the length of the filaments, two together, rather shorter than the petals. *Germ* none. FEMALE on a distinct tree. *Peduncles* in bundles from tuberosities over the trunk, and larger branches, one-flowered as in the male. *Flowers* larger than the male ones, and
III. fragrant. *Stamina* none, but round the base of the germ are inserted about ten pinnatifid,
837 villous bodies. *Germ* superior, round, slightly five-lobed, one-celled, containing numerous ovula attached to five parietal receptacles, as in Jussieu's *Capparides*, to which this will no doubt belong. *Styles* five, shorter; *stigmas* large, sagittate-cordate. *Berry* globular, of the size of a shaddock, one-celled. *Cortex* thick, rough, ash-coloured on the surface, internally brown, and composed of rays pointing to the centre of the berry. *Receptacle* in the ripe state uncertain. *Seeds* numerous, of the size of large filberts, immersed in pulp, various in shape, but in general nearly oval, smooth, light gray. *Integuments* two; the *interior* one membranaceous. *Perisperm* conform to the seed, fleshy, of a whitish gray. *Embryo* white. *Cotyledons* sub-reniform. *Radicle* oval, direction various.

The seeds of this tree, called Chaulmoogree, or Petarkura by the natives, are employed by them in the cure of cutaneous disorders. When freed from the integuments, they are beat up with clarified butter, into a soft mass, and in this state applied thrice a day to the parts affected.

TREWIA. Linn.

MALE. *Calyx* from three to four-leaved. *Corol* none. *Stamina* numerous. FEMALE. *Calyx* beneath, from three to four-toothed. *Corol* none. *Style* four-cleft. *Drupe* four-celled, with a single, one-seeded nut in each. *Embryo* inverse, and amply furnished with a perisperm.

T. *nudiflora. Willd.* iv. 834.

Leaves opposite, cordate. *Flowers* axillary; the *male* ones on a pendulous raceme, the *female* ones solitary.

Tetragastris *ossea. Gært. Fruct.* ii. 130. *t.* 109. *f.* 5.
Canschi. *Rheed. Mal. i. t.* 42.
Rottlera *indica. Willd. Gœtt. Diar. Hist. Nat.* i. *p.* 8. *t.* 3.
III. *Beng.* Pitali.
838 A native of various parts of India; in Bengal it is common on the banks of the Ganges, where it grows to be a large tree; but the wood is soft, and of little or no value. Flowering time the hot season.

DIOECIA MONADELPHIA.

JUNIPERUS. Schreb. gen. N. 1552.

MALE *Calyx* of the ament, a scale. *Stamens* three. FEMALE. *Calyx* three-parted. *Petals* three. *Styles* three. *Berry* three-seeded, irregular, with the three tubercles of the calyx. *Embryo* inverse, and furnished with a perisperm. Page Carey Ed.

1. J. *elata. R.*

Arboreous. *Leaves* crowded, without order, erecto-patent, sub-cylindric, mucronate.

A large timber tree, a native of the Island of Pulo Pinang, and of a very slow growth; at least in the Botanic garden, where the oldest plants are not less than fifteen years old, and not more than seven feet high.

2. J. *aquatica. R.*

Shrubby. *Leaves* single, distichous, linear, not mucronate.

Chin. Theng-tsong.

Common on the little uncultivated slips of land which separate rice lands in the vicinity of Canton and China; and from thence introduced into the Botanic garden by Mr. W. Kerr.

3. J. *chinensis. Willd.* iv. 851.

Shrubby, very ramous and spreading much. *Leaves* tern, crowded, sub-imbricated, mucronate.

From China this elegant, low, spreading, glaucous shrub, has been introduced into the Botanic garden at Calcutta. III. 839

4. J. *communis. Willd.* iv. 853.

Shrubby. *Leaves* tern, patent, very sharp pointed.

Chin. Tien-tsong.

A very beautiful, densely ramous shrub, with a short distinct trunk, covered with dark brown bark which now and then peels off in little flakes; some few of the little twigs bear opposite, imbricated, small, obtuse leaves as in *barbadensis*, but I have not yet observed any tendency to the complanate form, in this pretty glaucous species.

5 J. *cernua. R.*

Shrubby, branches rather thin, with their extremities drooping elegantly. *Leaves* tern, spreading, mucronate.

Chin. Ying-loe.

A most elegant, thinly branched, small shrub, with a very distinct trunk, covered with smooth, dark brown bark; the exterior coat whereof peels off from time to time; branchlets drooping like the Weeping Willow; these leaves are rather larger, more remote and of a purer green than in the other species from China.

6. J. *dimorpha. R.*

Shrubby. *Leaves* tern, spreading mucronate, some few are also opposite and imbricated in rows, they are minute and obtuse.

Chin. Kong-nam-tsong.

A beautiful, very ramous shrub, with a distinct, short trunk, covered with dark brown bark; some few of the little branchlets having a tendency to the flat, or complanate form, and those have short, oval, obtuse, opposite, appressed leaves, as in J. *barbadensis*. MALE. *Calyx* none. *Corol* none. *Stamina* many. *Anthers* peltate, eight-cleft, in our China species two-lobed. FEMALE. *Corol* none. *Style* none. *Seed* one in a berried calycle which is quite entire. III. 840

7. J. *Chinensis. R.*

Leaves scattered, approximate, linear-lanceolar, rather obtuse. *Male aments* cylindric. *Anthers* two-lobed.

A native of China, in the Botanic garden the male plant flowers in February.

CISSAMPELOS. Schreb. gen. N. 1555.

MALE. *Calyx* from four to six-leaved. *Corol* none, or three-petalled. *Anthers* on the margin of the peltate apex of single filaments. FEMALE. *Calyx* and *corol* various. *Germ* superior, one-celled, one-seeded; *attachment* lateral. *Berries* oblique, containing one rugose, doubled seed. *Embryo* inverse, uncinate, and furnished with a perisperm.

1. C. *glabra. R.*

Perennial, twining, every part smooth. *Leaves* round cordate, peltate, scarcely repand; *umbels* axillary, compound; *male umbellets* cymose.

Peer-gruj is the vernacular name in Silhet, where it is indigenous, and the root, which is very acrid, is used in medicine by the natives. Flowering time the month of May, and the seed ripens in November.

Root tuberous, perennial, of various shapes like other irregular tubers, but tending most to the roundish form, and often as large as a man's head, smooth and whitish. *Stems* and *branches* twining to an extent of some fathoms, while young smooth, of a glossy green; when old the bark is ash-coloured. *Leaves* long-petioled, profoundly peltate, roundish or reniform-cordate, smooth, with the *margins* often slightly repand, and the length and breadth nearly equal, viz. from two to six inches. *Petioles* longer than the leaves, round and smooth. MALE. *Umbels* axillary, solitary, or in pairs, compound, their peduncles rather shorter than the petioles. *Umbellets* single, long-pedicelled, cymose, and in this it differs widely from those III. 841 of C. *hexandra*, where they are globular heads. *Involucres* subulate. *Calyx* six-leaved; *leaflets* obovate. *Petals* three, obovate. *Filaments* single, columnar, with a peltate apex, round the margin of which is the pollen-bearing groove. FEMALE FLOWERS on a different plant. *Umbels*

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axillary, solitary, much smaller and shorter-peduncled than in the male, compound; *umbellets* from six to ten, minute, six or twelve-flowered. *Involucres* and *involucrets* small, subulate, one to each division. *Calyx* of one small, oval leaflet, pale yellow. *Corol* two-petalled; *petals* opposite, roundish, concave, longer than the calyx, of a deep orange yellow. *Germ* superior, long-ovate, one-celled, containing a single ovulum, attached to the gibbous side of the cell. *Style* short. *Stigma* from four to five-cleft. *Berry* obovate, of the size of a pea, having the remains of the style remaining near the base, succulent, smooth, red, one-celled. *Seed* solitary, doubled like a horse shoe, with the convexity up, and so exactly like *Gærtner's* Waltiedde. *vol.* ii. *p.* 488. *t.* 180. *f.* 12. that it may well be referred to this. *Integuments* two, the exterior one subnuciform, two-valved. *Perisperm* conform to the seed. *Embryo* nearly the length of the perisperm, inverse, linear, uncinate. *Radicle* with the apex under the stigma.

2. C. *hexandra. R.*

Shrubby, twining. *Leaves* peltate, cordate, entire, nine-nerved. *Umbels* compound. *Male umbellets* globular heads of flowers, with a six-leaved calyx, and three-petalled corol; in the female the calyx is three-leaved, and the corol three-petalled.

Beng. Neemooka.

Pada-valli, or Pada kelangu, *Rheed. Mal.* vii. *t.* 49. is like the female plant.

Stephania *rotunda. Lourier. Cochin Ch.* 747.

Menispermum *peltatum. Willd.* iv. 827.

III. A native of Bengal. Flowering time the beginning of the rains.

842 3. C. *convolvulacea. Willd.* iv. 863.

Perennial, twining. *Leaves* sub-peltate, from ovate-cordate to reniform. *Male flowers* panicled; *female* racemed, with reniform, many-flowered bractes. *Calyx* and *corol* of one obovate, ciliate scale each.

Teling. Pata.

Menispermum *orbiculatum. Willd.* iv. *p.* 828.

Cattu-valli, or Battu-valli. *Rheed. Mal.* xi. *p.* 127. *t.* 62.

A native of Coromandel, Malabar, &c.

4. C. *Caapeba. Willd.* iv. 863.

Perennial, twining, tender shoots very woolly. *Leaves* broad-cordate, scarcely peltate, woolly. *Female flowers* racemed, with sessile, cordate acuminate, many-flowered bractes; a one-leaved, oblong, acute calyx, and obcordate corol.

A native of the Moluccas. It flowers during the hot season in the Botanic garden.

5. C. *hernandifolia. Willd.* iv. 861.

Perennial, twining, villous. *Leaves* profoundly peltate, cordate, apex mucronate, base truncate, hairy underneath.

An extensively twining perennial, a native of Chittagong, from thence it has been about two years introduced into the Botanic garden but has not yet blossomed, which must account for the imperfection of the definition.

6. C. *tetrandra. R.*

Shrubby, twining. *Leaves* peltate, reniform-cordate, entire. *Male inflorescence* axillary, compound. *Flowers* tetrandrous. *Calyx* four-leaved. *Nectary* cup-shaped, filled with stamina.

A native of Amboyna.

MYRISTICA. Schreb. gen. N. 1562.

III. 843 MALE. *Calyx* trifid. *Corol* none. *Filament* single, columnar; *anthers* several pairs round the enlarged apex of the filaments. FEMALE. *Calyx* as in the male. *Corol* none. *Germ* superior, one-celled, one-seeded; *attachment* inferior. *Drupe* superior, fleshy, two-valved, nut one-seeded, covered with a multifid aril, commonly called mace. *Embryo* inferior, and furnished with an ample ruminated perisperm.

M. *moschata. Willd.* iv. 869.

Leaves oblong. *Male flowers* several on simple and compound axillary racemes. *Female flowers* solitary. *Calyxes* pitcher-shaped.

M. *officinalis. Linn. Syst.* 493. *Suppl.* 265. *Gært.* i. *t.* 41.

M. *Moschata. Woodville's Medical Botany,* 363. *t.* 134.

Nux myristica. *Rumph. Amb.* ii. 14. *t.* 4.

Jay-phalu, the Sanscrit name of the *nutmeg,* and Jati the *mace.*

Jaga-phul, the Bengalee name of the *nutmeg,* and Jatri the *mace.*

Jouz-bewa of the Persians.

A native of the Moluccas, and other Islands in their vicinity, bearing *male* and *female* on different trees; and there blossoming and bearing fruit the whole year. In some instances I have observed them to be monoicous.

Trunk straight up to the top of the tree, as in the pines. *Bark* smooth, and of a greenish ash, or dirty olive colour. *Branches* in regular equi-distant verticels, nearly horizontal, with their extremities often drooping. *Leaves* alternate, sub-bifarious, short-petioled, oblong, entire, smooth on both sides, but paler underneath, when bruised faintly aromatic; from three to six inches long, and from one to two and a half broad. MALE. *Racemes* axillary, often two-cleft near the apex, with the divisions spreading. *Flowers* numerous on ascending, clavate pedicels, nearly as long as the peduncles, small, inodorous, and yellow. *Bractes* of the pedicels solitary, minute, one-flowered, caducous, those of the four lower ones also solitary,

but larger, fleshy, more permanent, and embracing two thirds of the base of the calyx. *Calyx* pitcher-shaped, mouth three-toothed. *Corol* none. *Filament* single, resting in the centre of the calyx and nearly of the same length, thick, linear-oblong, and obtuse. *Anthers* in general about nine pairs, linear, adjoined lengthways to the upper half of the filaments, but their chief bond of connexion appears to be at their lower extremities. FEMALE. *Peduncles* axillary, solitary, rather longer than the petioles, while in blossom ascending one-flowered. *Bractes*, that of the flowers as in the male. *Flowers* small, yellow, inodorous. *Calyx* as in the male. *Corol* none. *Germ* ovate, one-celled, containing a single seed, attached to the bottom of the cell. *Style* scarcely any. *Stigma* two-lobed. *Drupe* superior, somewhat turbinate, smooth, of the size of a small pullet's egg; when ripe yellow, and then dividing into two equal portions, beginning at the apex, one-celled. *Nut* oval, ovate, or nearly round, marked with broad superficial furrows corresponding with the divisions of the deep orange coloured aril, or mace, otherwise smooth; colour a dark brownish black, very hard, and as the shell is of equal thickness every where, these impressions are equally evident on the inside, and are communicated to the seed, or *nutmeg*, itself, attached by a large umbilicus to the bottom of the cell. *Seed* conform to the nut, and covered with a single, light brown, thin, spongy integument. *Perisperm* conform to the seed, while fresh rather soft, juicy, and somewhat farinaceous, variously variegated, (*ruminatum, Gært.*) with rust coloured veins, while fresh more fragrant than after being dried. *Embryo* erect, patelliform, lodged in the base of the perisperm, white, and of a firm fleshy consistence. *Cotyledons* two, thick, fan-shaped, and expanding from the middle upwards; margins irregularly cut, or crenulate. *Plumula* of two unequal lobes. *Radicle* inferior, hemispherical. III. 844

It is well known that the description of this plant in the *Supplementum Plantarum* of the younger Linnæus, taken from Sonnerat is that of another species.

Lamarck's description, so far at least, as relates to the stamens and style, appears to me to have been taken from the flowers of some other species of *Myristica* which he received from the Isle of France, for the true nutmeg. Consequently the sort they have been long cultivating there, with so much care, is not the real *Banda* nutmeg, which the Dutch so long and so effectually monopolized. For I can scarcely think it possible that any Botanist could consider the thick, firmly consolidated filament of the male flowers, to be composed of from six to twelve smaller, partible filaments, joined in one bundle, for there is not the smallest rudiment of any smaller filaments connecting the linear anthers to the column, or filament, in the centre; nor are the anthers themselves united, scarcely even the two lobes which compose the pairs, as I have called them. III. 845

The foregoing description, and accompanying drawing, are taken from many, healthy growing trees in the Honourable Company's Botanic garden as well as from numerous specimens, preserved in spirits, and otherwise collected, and sent from Great Banda Neyra, Pulo-ay, and the Molucca Islands, while they were in the possession of the English from 1796 till 1802. At Bencoolen, where this tree was introduced in 1798, they have grown with the greatest luxuriance; for in five years they had arrived at from ten to fourteen feet in height. In October and November 1802, two hundred and forty-seven trees out of about six hundred, blossomed. About half of these were male, the rest female, and ripened their fruit in February and March 1803. In the Botanic garden at Calcutta, where the young trees are about the same age, the most luxuriant ones are from six to ten feet high, and in April 1803 three male trees only blossomed for the first time. At Prince of Wales' Island, where by far the most extensive plantations are formed, they are in a middle state between Bencoolen and Bengal, but do not by any means thrive so well as in Sumatra, where they are perfectly at home, in every respect, and earlier than in the Molucca Islands. III.

Note. The plantations in the vicinity of Bencoolen have continued to thrive and multiply astonishingly till the present time, 1809. The trees now amount to about six thousand six hundred, are abundantly productive, and both nuts and mace are uncommonly fine. 846

2. M. *macrophylla. R.*

Leaves short-petioled, cuneate-oblong, clothed with fine down underneath, with veins parallel and simple. *Female flowers* in lateral and axillary fascicles in very short diverging peduncles. *Germ* hairy.

Nux myristica. Mas. *Rumph. Amb.* ii. *t.* 5.

The female specimens in flower have only been seen; and they are easily distinguished from the other species, by the great size of the leaves, and the fascicles of sub-sessile female flowers, with hairy germs. This cannot well be referred to Willdenow's M. *tomentosa*, on account of the shape of the leaves.

3. M. *montana. R.*

Leaves ovate-lanceolate, smooth. *Flowers* axillary; *males* many, on a common, short peduncle; *females* one to three, on very short, proper peduncles only. Both *calyces* pitcher-shaped, and tridentate.

A native of the mountains of the Molucca Islands, where it grows to be a tree of considerable size, but the fruit made no use of.

4. M. *peltata. R.*

Leaves lanceolar, smooth, above shining. *Male flowers* axillary, fascicled, rotate, staminiferous, column peltate, with about twelve anthers round the under side of the margin.

A native of the Moluccas. The male flowers during the hot season in the Botanic garden at Calcutta.

5. M. *salicifolia. Willd.* iv. 871. III.

Leaves lanceolate, villous underneath. *Peduncles* axillary, from two to three-flowered. 847

Page Carey Ed. *Aril*, or mace, fleshy, and undivided; *nut* oblong.

Palala secunda. *Rumph. Amb.* ii. *p.* 26. t. 6.

A native of the Malay Islands.

6. M. *spicata. R.*

Leaves short-petioled, broad-lanceolate, smooth and firm. *Female flowers* numerous, on short, solitary, axillary spikes. *Calyces* pitcher-shaped.

A native of the Moluccas. Introduced into the Botanic garden in 1798, and in 1804 one female tree blossomed during the rains, when it was about twelve feet high. All the flowers proved abortive; no part of the tree possesses any fragrance.

7. M. *angustifolia. R.*

Leaves narrow-lanceolate, acute, smooth, entire, glaucous underneath. *Male umbellets* axillary, sub-sessile.

A very large tree, a native of the mountainous countries immediately east of Bengal, where it blossoms about the beginning of the rains in June.

8. M. *parviflora. R.*

Leaves short-petioled, ovate-oblong, smooth. *Female racemes* axillary, of the length of the petioles.

A native of the Molucca Islands. One female tree in the Botanic garden, in twelve years attained the height of about fifteen feet, with a straight trunk of proportional thickness. It blossoms regularly during the rains, but the flowers have hitherto proved abortive.

9. M. *linifolia. R.*

Leaves linear, smooth, and hard; *petioles* and other tender parts densely clothed with brown ramentaceous scales. *Male flowers* in axillary fascicles; *anthers* from fifteen to twenty
III. on the margin of a triangularly peltate dish.
848 A pretty large, tall, straight tree, a native of Chittagong, where it blossoms in January. The female tree not seen.

ADELIA. Schreb. gen. N. 1558.

MALE. *Calyx* from three to four-parted, or from three to four-leaved. *Corol* none. *Filament* ramous, branching out into many simple, or compound ramifications. FEMALE. *Calyx* five-parted. *Corol* none. *Germ* superior, three-celled; *cells* one-seeded; *attachment* superior. *Styles* three. *Capsule* tricoccous. *Embryo* inverse, with a scanty perisperm.

1. A. *castanicarpa. R.*

Arboreous. *Leaves* oblong, entire. *Stipules* falcate. *Flowers* axillary, crowded. *Calyx* four-leaved.

Beng. Boolkokra.

A large timber tree, a native of Silhet and Chittagong. The wood is said to be very hard. Flowering time November and December, and again in May and June. The seed ripens in May, and second crop in the cool season.

Young shoots a little hairy, but the hairs soon disappear, leaving them smooth. *Leaves* alternate, bifarious, approximate, short-petioled, from ovate-oblong to broad-lanceolate, rather acuminate, entire, of a firm and smooth texture, from four to five inches long, by from one to three broad. *Stipules* falcate, pretty large. MALE FLOWERS axillary, crowded, sessile. *Calyx* four-leaved; *leaflets* in two opposite pairs, ovate, ciliate. *Corol* none. *Nectary*, a crenulate cup, round the base of the column from the middle downwards; all are smooth. *Anthers* oblong, incumbent. FEMALE FLOWERS axillary, several together, some sub-sessile, some short-peduncled, small, of a dull grayish yellow colour. *Bractes*, some roundish, hairy scales round the base of the peduncles. *Calyx* of two opposite pairs
III of oval leaflets. *Corol* none. *Nectary* saucer-shaped, embracing the base of the germ
849 with its very finely dentate margin. *Germ* bristly, three, rarely four-celled, with one ovulum in each, attached to the top of the axis. *Styles* three, recurved and bifid with the segments, also recurved and shaggy. *Capsule* round, size of a nutmeg, completely armed with innumerable, hispid, acute, rather inoffensive light brown bristles, three-celled, six-valved; *valves* hard like the shell of most nuts. *Seed* solitary, attached to the top of the axis, and the attachment embraced by a crimson, fleshy gland, or aril; size of a grain of black pepper, but compressed. *Integuments* two; exterior thin, brittle, highly polished, black, inner a brown, thin membrane. *Perisperm* none, or most trifling. *Embryo* inverse. *Cotyledons* conform to the seed, oily. *Radicle* oval, superior.

2. A. *nereifolia. R.*

Shrubby. *Leaves* alternate, linear-lanceolate. *Spikes* axillary, solitary.

Teling. Taniki.

Mal. Katt-alluree.

A native of Coromandel, where it flowers during the hot season.

3. A. *cordifolia. R.*

Leaves alternate, long-petioled, round, cordate, entire. *Male spikes* axillary. *Anthers* four-valved.

A native of the Moluccas.

CRYPTOGAMIA MISCELLANEA.

[*From the "Cal. Journal of Nat. Hist." Vol. IV., No. XVI., Jan.* 1844.]

1. EQUISETUM.

Fructifications terminal, peltate, of many valves, bursting on the inside, verticillate on ovate-oblong spikes. (Stem and branches composed of tubes inserted into each other at the joints.)

E. debile. R. Icon. Roxb. Suppt. 5. t. 3. Wall. Cat. 13, No. 397.

Stems smoothly fluted, weak. Branches opposite, simple. Spikes terminal; of the stems often tern; of the branches single.

Nat. of swampy thickets in *Bengal.* Flowers during the rains.

Root perennial, creeping under the surface of the ground.

Stems numerous, about as thick as a stout crow-quill, length from 3 to 4, or even more feet, and then so weak as to require support, slightly marked with from ten to fifteen smooth grooves and elevations. *Joints* from 2 to three inches long, their mouths ending in as many ensiform scariose teeth as there are flutings on the outside. *Branches* simple, generally two at each joint, though sometimes one or three, slender: from 6 to 18 inches long, and with about half the number of flutings there are in the stems.

Spikes terminal, sub-cylindric, the largest which terminate the stems, about an inch long; from its base two smaller diverge in opposite directions. Those of the branches smaller, and always single.

Fructifications pedicelled, peltate, 5-6 celled, from 6 to 10 in a verticil; and about as many verticils compose the spike. *Pollen* or *seed* pale blue, composed of spiral threads, which are in constant motion when observed at a proper age; when examined earlier, they appear to be simple, minute, round, green grains, without motion.

2. MARSILEA. *Lemma, Jussieu.*

Involucre, or *receptacle* oval, shut, (transversely) many-celled; cells with anthers and pistils, which ripen into single seeds.

1. *M. quadrifolia. Linn. Spec.* 1563. Icon. Roxb. 14, t. 80.

Creeping. Leaves quatern; leaflets of the barren shoots very long-petioled, broad-obovate, large and entire, of the fertile small, and truncate-dentate. Capsules short-pedicelled. subreniform, one or two-toothed at the base.

Teling. Chick-linta-kura.

Beng. Shooshnie-shak, who eat the leaves in their curries, &c.

Common on the borders of fresh water lakes, &c. over *India,* where it fructifies during the cold season. The long-pedicelled, oval capsules of Burman's *M. coromandeliana, Flor. Ind.* t. 62. f. 3, indicate a different plant, yet I never could find any other, though long and diligently looked for.

3. SALVINIA.

MALE.

FEMALE.—*Capsules* among the roots, 1-celled, many-seeded.

1. *S. verticillata. R.*

Floating. Leaves opposite at the joints, petioled, oval, flat, verrucose. *Capsule* from the under-side between the insertion of the leaves, pedicelled, surrounded with a verticil of long, hairy roots. Seeds numerous on a free central receptacle.

Beng. Uiki-pana.

2. *S. cucullata. R.* Wall. Cat. 13, No. 399.

Ramous. Floating. Leaves opposite, subsessile, cowl-shaped, erect with an opening on the inside.

Beng. Indurni-pana.

3. *S. imbricata. R.*

Floating, ramous, winding. Leaves sessile, alternate, bifarious, imbricated, trapeziform, fleshy. Capsules covered by imbricated scales, between the roots, on the underside of the plant.

All three are found floating on lakes, or pools of sweet water, throughout *Bengal,* during the rainy season.

4. ISOETES.

Anthers of the male flower within the base of the inner leaves. *Capsules* of the female flower 1 or 2-celled, within the base of the exterior leaves.

1. *I. capsularis. R.* Icon. Roxb. 14, t. 81.

Capsules peduncled, 1-celled. Leaves linear, flat.

This plant grows in deep standing sweet water, with *Valisneria spiralis,* &c.

Stoles creeping, jointed, tufts of filiform roots descend from each joint, and from 4 to 12 leaves ascend; they are like those of *Valisneria spiralis,* very delicate, 2-3 feet long, a quarter of an inch broad, and slightly serrated near the apex. From the axe of the leaves

arise several diaphanous, cordate capsules standing on short peduncles; they consist of 1-cell, formed of two valves, opening from the apex, the seeds are numerous connected to a conical receptaculum in the centre.

I have not seen the male flowers.

2. *I. coromandeliana. Linn. Suppl.* 447. Icon. Roxb. 14, t. 82.

Capsules sessile within the enlarged base of the leaves, 1-celled. Leaves filiform, erect, semi-columnar.

A native of wet marshy places up amongst the Circar mountains, where it appears during the rainy season.

Root consists of a numerous tuft of small capillary filaments issuing from the base of the head, which is composed of the enlarged bases of the leaves forming an imbricated bulb. *Leaves* radical, erect, filiform, half columnar, about 6-8 inches long, smooth, inwardly interrupted every $\frac{1}{4}$ or $\frac{1}{6}$ of an inch, yet the leaf is not visibly contracted, nor does it appear jointed.

Capsules oval, concave on the inner side and convex on the outer, conforming to the enlarged base of the leaves which cover them, 1-celled.

Seeds numerous, like very fine sand.

I have not seen the male flowers.

5. LYCOPODIUM.

Capsules in the axils of the scales, digested into oblong imbricate spikes, or of the leaves themselves; kidney-shaped, 2-valved, many-seeded.

1. *L. Phlegmaria. Dill. musc. t. bs. f.* 5. Icon. Roxb. 14, t. 84.

Perennial, parasitic, pendulous. Leaves numerous, ovate-lanceolate. Spikes terminal, dichotomous, or simple.

Beng. Shitahar.

Tama ponel patsia maravara. *Rheed. Mal.* 12, *t.* 14.

Equisetum amboinicum. *Rumph. Amb.* 6, *t.* 41, *f.* 1.

Found in the *Sunderbunds*, on old trunks of trees, in flower during the rains.

Root perennial, fibrous.

Stems numerous, succulent, pendulous, 2-3-forked, round, from 6 to 10 furrowed, the leaves being inserted on their corresponding ridges; about 18 inches long, and towards the base as thick as a common rattan.

Leaves very numerous, horizontal, subsessile, not verticilled but in from 6 to 10 rows; their short petioles have a half twist, which brings their edges in the situation of the upper and under surface of the leaves of most plants, so that in looking down from the top, they resemble so many radii; their shape is ovate-lanceolate, very acute, smooth, entire, veinless, of a firm rigid texture.

Spikes terminal, numerous, about 2 inches long, cylindric, simple, or 2-forked, imbricated with numerous, oval, sessile, appressed bractes, or floral leaves.

Fructification, a reniform, apparently sessile, (I say apparently, because there is a pedicel corresponding in length to the depth of the concavity of the capsule,) 2-valved, capsule in the axil of each bracte, they open spontaneously round the convex margins, and discharge much very fine cream-coloured dust, like seed or pollen. I could see no other kind of flowers.

Rheede's figure Tana-ponel-poatsia Maravara, vol. 12. *p.* 27, *t.* 14, differs from my plant, in the number of the rows of leaves, and in the spikes being much longer, yet I have no doubt of their being the same.

2. *L. cernuum. Dill. musc. t.* 63. *f.* 10.

Shrubby, very ramous. Leaves numerous, subulate, incurved. Spikes short, cylindric.

Bellan-patsja. *Rheed. Mal.* 12. *t.* 39.

Cingulum-terræ. *Rumph. Amb.* 6, *t.* 40, *f.* 1.

Nat. of various parts of *India*. Is terrestrial.

3. *L. pendulum. R.*

Parasitic, shrubby (1-2 feet long,) pendulous, dichotomous. Leaves generally tern, imbricated, appressed, channelled, lanceolate, rigid, entire, smooth. Spikes terminal, very long, and scarce distinguishable from the barren parts.

Nat. of *Amboyna.*

4. *L. filiforme. R.* L. Phlegmaria Linn. Wall. Cat. p. 62, No. 133.

Parasitic, drooping, (1-2 feet long.) Leaves tending to be tern, triangulari-cordate, acute, smooth, and entire. Spikes filiform, numerous, dichotomous, and often as long as the rest of the plant, scales thereof opposite, ovate, scarcely longer than the capsules.

Nat. of *Sumatra.*

Dillenius has no figure any thing like it.

5. *L. rotundifolium. R.* Wall. Cat. 65, No. 2183.

Parasitic, drooping, (2-3 feet long.) Leaves approximate, opposite, sessile, round-oval, entire, smooth. Spikes filiform, dichotomous, scales thereof approximate, opposite, ovate, length of the capsules.

Nat. of *Sumatra*, and a most beautiful species it is.

6. *Lycopodium aristatum. R.*

Patent, (1-3 inches long,) dichotomous. Leaves as well as the superficial scales alternate, bifarious, ovate-falcate; membrane margined, apex ending in a bristle or arista.

From *China* this pretty little species was brought to the Botanic Garden at *Calcutta* in

1812, where it grows freely in a rich, shaded, moist soil. It resembles most *Dillenius's figure, t.* 66, *f.* 7.

7. *L. mimosoides. R.* L. elegans. Wall. Cat. No. 62, 128. (quod nomen delendum.)

Suffruticose, oblique; branches alternate, bifarious with alternate bifarious branchlets, (exactly like the pinnæ of a fine-leaved *mimosa.*) Leaves alternate, bifarious, sessile, expanding, falcate, somewhat acute, smooth, entire; superficial scales (stipules,) semiovate mucronate. Spikes short, imbricated 4-ways; scales long, cordate, acute.

Nat. of the *Moluccas.*

8. *L. lævigatum, Lamark. Encyclop.* 3, 652. Wall. Cat. 65, No. 2185.

Somewhat suffruticose, leaning, and emitting roots, (12 inches high,) branches and branchlets alternate, bifarious. Leaves alternate, sessile, bifarious, expanding, falcate, smooth, superficial scales (stipules) obliquely-oblong, smooth, cuspidate. Spikes short, imbricated four-ways: scales cordate, cuspidate, margined, twice the length of the round-reniform capsules.

Muscus fruticescens. *Rumph. Amb.* 6, *t.* 39, *f.* 2.

Nat. of the *Malay Islands.*

9. *L. pectinatum. Lamark. Encyclop.* 3, 651. L. semi-cordatum, Wall. Cat. 62, No. 126?

By far the greatest part of the plant erect. Branches bifarious, alternate, dichotomous. Leaves alternate, bifarious, expanded, falcate, obtuse, smooth; posterior lobes protruded; superficial scales subelliptic, mucronate. Spikes short, imbricated four ways; scales thereof reniform-cordate, acute, and longer than the reniform-capsules.

Nat. of the *Malay Islands.*

10. *L. plumosum. Dill. musc. t.* 66, *f.* 10. L. atroviride. Wall. Cat. 62, No. 120?

Creeping, branches oblique, dichotomous. Leaves alternate, bifarious, expanded, oblong, obtuse; posterior lobes stem-clasping and ciliate; superficial scales subovate, ciliate, and awned. Spikes imbricated four ways, with taper-cordate, ciliate, acute scales, twice longer than the cordate capsules.

Nat. of various parts of *India.* In *Bengal* it is found on rotten wood.

11. *L. furcatum. R.* L. atroviride. Wall. Cat. 62, No. 120, (quod nomen delendum.)

Perennial, scandent, dichotomous; with long, simple roots from the forks. Leaves bifarious, spreading, oblong, falcate; anterior lobe large, and stem-clasping; superficial scales oval, and mucronate. Spikes solitary, or in pairs, imbricated with four rows of cordate scales, which are greatly longer than the round cordate capsules.

Nat. of *Pullo-Pinang.*

12. *L. imbricatum. R.*

Creeping, (2-3 inches long,) dichotomous, very ramous. Leaves alternate, imbricated, bifarious, falcate-cordate, smooth; superficial scales of the same shape, but small and cuspidate.

Hatha-joori of the Hindu M. M.

Found by H. Colebrooke Esq. amongst stones, in moist, cool shaded places, over *Behar.*

CRYPTOGAMIA FILICES.

6. OPHIOGLOSSUM.

Spikes distichous. *Capsules* (or cells) opening transversely, without an elastic ring. *Seeds* numerous.

1. *O. cordifolium. R.* Icon. Roxb. 14, t. 85.

Fronds simple, ovate, and ovate-cordate, veinless, bearing the spike, surmounted on a scape greatly longer than the leaf.

Beng. Danga-ghechu, or Ekteera.

Ophioglossum simplex. *Rumph. Amb.* 6, *t.* 68, *f.* 2.

Nat. of *Bengal, Moluccas,* &c. in cool shaded places, where it appears, and fructifies during the rainy season.

Root fibrous.

Stems or rather stipes few, compressed, erect, smooth, 2 or 3 inches long.

Fronds cordate, entire, waved, a little rugose, nerveless, but with many small, not very conspicuous, reticulated veins; smooth on both sides; about two inches long, and one and a half broad.

Scape erect, issuing from the upper part of the stipe, (petiole,) on the foreside; simple, a little compressed, smooth, from 3 to 6 inches long.

Spikes simple, distichous, not jointed, except the openings of the cells can be so called; tapering a little, fine pointed.

Cells numerous, arranged along the margins of the spikes, opening transversely near the base.

Seeds most numerous, globular, white.

I have, in luxuriant plants, found the stem divided into two towards the top, with a leaf and spike to each division.

Ophioglossum simplex. *Rumph. Herb. Amb. tab.* 68, *f.* 2, appears more like *O. vulgatum,* than the above described plant.

2. *O. filiforme. R.* Icon. Roxb. 14, t. 86. Lygodium microphyllum, Br.

Perennial, scandent, filiform, smooth. Fronds conjugate-pinnate: leaflets subcordate, with the spikelets of the fructifications on their anterior margins.

Tsjeria valli-panna. *Rheed. Mal.* 12, *t.* 34.

Adiantum volubile minus. *Rumph. Amb.* 6, *t.* 32, *f.* 3. Hydroglossum scandens, Willd 5, 77.

Nat. of various parts of India, time of fructifying the rainy season.

Root running under the surface of the ground, towards the apex olive, while the older parts are of dark rust colour, and villous, about as thick as a goose-quill, from these descend many ramous, dark coloured fibres.

Stems issue from the large creeping roots, alternate, scandent, filiform, flexuous, smooth; their general length from 2 to 3 feet, and very slender.

Fronds alternate, conjugate on a very short common petiole.

Pinnæ 2-3 inches long, composed of about four pair of alternate, petiolated, sub-cordate, smooth leaflets. The fertile ones are deeply cut into linear segments or spikelets; on the under side of which the fructifications are lodged, in the same manner as in *O. scandens.*

3. *O. scandens. Linn. spec. pl.* 1518. Lygodium semibipinnatum, Br. Wall. Cat. 63, No. 175.

Perennial, scandent. Fronds conjugate-pinnate: leaflets linear, bearing the spikelets on the whole of the margin.

Tsjura-valli-panna. *Rheed. Mal.* 12, *t.* 33. Hydroglossum pinnatifidum, Willd. 5. 80.

Nat. of the *Malay Islands, Chittagong, Malabar, &c.* Is common in most parts of *India.* Flowering time the rainy and cold season.

Root perennial.

Stipes scandent, or twining, and of considerable extent, several yards often; about as thick as a pack thread, and smooth.

Fronds paired on common, alternate petioles; compound and decompound; *leaflets* or lobes thereof tapering from the base.

Spikelets on the margins of the leaflets, resembling deep serratures; they are imbricated with two rows of scales, each enclosing a single, ovate, sessile, 1-celled capsule, containing innumerable, minute, yellow seeds.

4. *O. flexuosum. Linn. spec. pl.* 1519.

Perennial, scandent. Fronds conjugate-pinnate, rarely bi-pinnate, the barren generally palmate; leaflets subensiform, (long and narrow,) bearing spikes on both sides.

Beng. Bhootraj.

Valli-panna. *Rheed. Mal.* 12, *t.* 32. *bad.*

5. *O. furcatum. R.*

Scandent. Fronds dichotomous, ultimate divisions linear, very long, finely pinnatifid, with numerous minute spikelets.

Nat. of *Pullo Pinang.*

7. OSMUNDA.

Capsules subglobose, disposed on a spike, or back of the fronds, 2-valved, 1-celled, opening transversely, without an elastic ring.

1. *O. zeylanica. Linn. sp. pl.* 1519. Icon. Roxb. 14, *t.* 88.

Fructifications disposed on a single, subcylindrial, cauline spike, composed of several spherical, 2-valved folliculi, lodged under the lacerated segments of peltate receptacles; opening on the outside, near the base, and emitting numerous minute grains. Fronds pinnate-pedate; divisions lanceolate, waved.

Beng. Ekbeera.

Ophioglossum laciniatum. *Rumph. Amb.* 6, *t.* 68, *f.* 3.

Root, a creeping larger shoot, with thick fibres, which every year pushes forth one new frond from the apex, while a portion decays at the other end.

Stipe 6-8 inches long, erect, nearly round, and smooth.

Frond solitary, pedate. *Leaflets* thereof lanceolate, with their margins much waved, and irregularly scalloped; smooth on both sides; veins numerous, very fine, expanding; length from 4 to 6 inches.

Spike from the apex of the stipe where the three first divisions of the frond are inserted. *Scape* rather shorter than the stipe, *(spike)* subcylindric, about one-third the length of the scape, closely covered with the fructifications.

Fructifications generally from 4 to 6; minute, spherical bodies, closely surround a small, short, sessile raggedly peltate receptacle, which unites them to the common axis, or rachis.

Nat. of *Amboyna* and *Bengal.* Fructifies during the rains in the Botanic Garden at *Calcutta.*

2. *O. lanceolata. R.* Icon. Roxb. 14, t. 89.

Scapes radical, naked, cylindric. Fronds simple, lanceolate, waved, and scalloped.

8. ACROSTICHUM.

Fructifications occupying almost the whole of the under surface of the fronds, without any other involucre than little scales, or hairs interspersed amongst the capsules, which are girt with an elastic ring.

1. *Acrostichum ramentaceum. R.*

Petioles of the barren leaves short, (2-3 inches,) and shaggy ; of the fertile long, (10-15 inches,) and smooth ; barren leaves linear-cordate ; fertile cordate-sagittate ; all have entire margins.

Nat. of *Chittagong*, and grows in the earth. Intermixed amongst the numerous crowded capsules, are many pretty long brown filaments.

2. *A. heterophyllum. Linn. spec.* 1523.

Parasitic, creeping. Fronds entire, both sides clothed with minute stellate pubescence ; the barren oblong, the fertile cylindric. Fructifications of single, pedicelled capsules, mixed amongst much, soft, short, downy pubescence.

Maretta-mala-maravara. *Rheed. Mal.* 12, *t.* 39.

Nat. of the *Malay Islands*, *Sunderbunds*, &c.

3. *A. radiatum. Kœn. MSS.* Roxb. Icon. 14, t. 90. Asplenium radiatum. Sw. Wall. Cat. p. 63, No. 197.

Fronds long-stiped, pinnatifid in a semicircle, (fan-shaped,) rays more or less divided, with truncate, ragged extremities. Petioles 3-sided and grooved.

A. australe. Vahls. symbolæ. 1, *t.* 25.

Nat. of the mountains of *Coromandel*, growing in clefts of rocks. The whole height rarely exceeds 6 inches.

4. *A. semipinnatum. R.*

Fronds (2 feet high,) with about two distinct, subopposite pairs of pinnæ, and a deeply, 2 or 3-lobed terminal one ; they are broad-lanceolate, with uneven margins, and smooth on the upper surface.

Nat. of the *Malay Islands.*

5. *A. emarginatum. Buch.* Icon. Roxb. 14, t. 91.

Stipes smooth, green, with a few remote thorny points. Fronds pinnate ; leaflets alternate, linear, smooth, entire, emarginate, fertile and barren alike.

Nat. of the *Delta of the Ganges.* Fructifies in the rainy season.

Roots fibrous, issuing from a firm, subrotund head, even with the earth, round which the stipes are attached.

Stipes in bundles, straight, smooth, polished, green, with remote thorny points on the margins of the furrow, which runs up the forepart ; length about one, or one and a half foot.

Fronds pinnate, from 2 to 4 feet long, *leaflets* generally alternate, about 12 or 14 on each side, short-petioled, linear, entire, smooth, emarginate, *fertile* leaflets like the abortive, and are the most exterior ; general length about 6 inches, and about 1 broad.

6. *A. alatum. R.*

Fronds pinnate, (12 inches high,) the barren pinnæ alternate, linear, crenate, smooth, truncated at the base, and there enlarged at the upper angle ; fertile pinnæ very minute, linear-oblong, on distinct stipes which are rather longer than those of the barren fronds.

Nat. of the *Malay Islands.*

7. *A. seetacoonense. R.*

Fronds (18 inches high,) subopppositely pinnate ; barren leaflets linear-oblong, base truncate, margins crenate-serrate, smooth ; fertile alternate, slender, cylindric. Spikes on longer and more delicate stipes.

Nat. of *Chittagong*, near the burning wells at *Seetacoond.*

9. POLYPODIUM.

Fructifications in roundish, scattered, not marginal spots, (generally) with a peltate ***involucre***, separating round the edges. *Capsules* girt with an elastic ring.

Section I.—*With simple leaves.*

1. P. *coriaceum. R.* Icon. Roxb. 14, t. 92. P. sphærocephalum. Wall. Cat. p. 64, No. 272, (quod nomen delendum.)

Parasitic, creeping to a great extent. Fronds undivided, linear-lanceolate, thick and very firm ; above polished, underneath hoary, with stellate down. Fructifications solitary, (that is in one longitudinal row of large, rather remote, naked spots, on each side, equally distant from the nerve and margin.)

Nat. of the *Malay Islands* and *Pullo Pinang*, whence introduced into this Garden by Mr. W. Roxburgh, Jun.

Parasitic, *stems* creeping amongst moss on trees, and putrid wood ; round, winding, as thick as a crow-quill, imbricated with numerous, oblong, brownish black, smooth scales ; while young and tender, these end in long, slender, tapering, soft, membranous tails.

Stipes triangular, channelled on the upper side, polished ; from three to six inches long.

Fronds linear-lanceolate, most entire, from six to eighteen inches long, of a remarkable firm thick texture, polished on the upper surface ; underneath hoary with soft stellate down.

Fructifications in a single row, of large, rather remote spots on each side, and about equally distant from the nerve and margin ; though when the fronds grow old their margins become revolute, and appear almost to touch the spots.

Involucre none. While the fronds are young, the spots are clothed with the same stellate down which clothes the frond underneath.

2. *P. attenuatum. R.*

Parasitic, creeping, stipes alternate, smooth. Fronds linear lanceolate, rather obtuse, much attenuated at the base, both sides smooth. Fructifications solitary, very large.

Nat. of *Pullo Pinang.*

3. *P. glabrum. R.* Icon. Roxb. 14, t. 93. Wall. Cat. p. 10, No. 281.

Parasitical, rooting. Fronds subsessile, linear-lanceolar, from premorse to acute, smooth, and fleshy. Fructifications scattered in numerous dots, below the apex of the frond. Involucres obscure.

Beng. Chitteea-borah.

Nat. of *Bengal.* Found near *Calcutta* on the trunks of large old trees, &c. where there is much shade and humidity.

Root perennial, creeping, with many ramous dark coloured fibres, generally covered with moss, bending in various directions, rough with umbilicated tuberosities, (the remaining sites of the fallen leaves,) otherwise the surface, when cleaned of earth, &c. is smooth, and of an olive colour.

Fronds numerous, erect, sub-sessile, simple, lanceolate, entire, veinless, fleshy, very smooth on both sides; from 12 to 24 inches long, and from 2 to 3 broad, fertile and barren fronds alike.

Fructifications in minute dots, irregularly scattered over the upper third or half of the frond.

Capsules numerous, kidney-shaped, with an elevated, crenulated, brown band round the convex side of the transparent integument; each contains some minute grains, of a most beautiful bright shining gold colour.

4. *P. phyllitidis.* Aspidiun Singaporianm, Wall. Cat. P. 64, No. 374?

Stipes scaly near the base. Fronds (6-12 inches,) lanceolate; entire, smooth. Fructifications in numerous scattered spots. Involucres obscure.

Nat. of *Chittagong.*

5. *P. pertusum. R.* Icon. Roxb. 14, t. 94. Wall. Cat. p. 10, No. 267.

Parasitic, creeping. Fronds lanceolar, fleshy, entire, acuminate; above smooth; underneath covered with minute scales. Fructifications lodged in deep pits, and so numerous over the upper half of the fronds, as often to render that part subcylindric. Involucre none.

A native of the *Delta of the Ganges,* where it surrounds the trunks of trees with its brown woolly roots, interwoven with various kinds of moss, &c.

Stems about as thick as a pack-thread, covered with dark, rust coloured scales.

Stipes round, channelled, covered with minute stellate scales.

Fronds lanceolate, fleshy, veinless; above smooth; underneath covered with minute stellate scales like the stipes. The fertile are in general narrower towards the point, with their margins involute, so as to appear like subcylindric spikes.

Fructifications in deep pits over the exterior portions of the fronds.

6. *P. tomentosum, R.* Icon. Roxb. 14, t. 95. P. mysurense Heyne? Wall. Cat. p. 64, No. 269.

Parasitic. Fronds lanceolate, entire, acuminate; downy underneath. Fructifications over the centre, and nearly hid by the thick, soft, stellate down.

Nat. of *Hindoostan,* on trunks of trees.

Root ramous, creeping amongst moss, &c.

Stipes from 2 to 3 inches long, clothed with soft, stellate, white down.

Fronds all lanceolate, entire, long fine-pointed, upper surface pretty smooth, but like the stipe the underside is clothed with soft, stellate down; length about six inches.

Fructification in numerous, large dots, over the centre of the back of the fronds and nearly hid by the thick, soft, stellate down, already mentioned.

7. *P. phymatodes. Linn. Mant.* 306.

Stipes smooth; fronds from simple to being divided into as far as five, or more, linear-lanceolate lobes. Fructifications scattered, large, and very conspicuous on the upper surface. Involucre none found.

P. scolopendria. Burm. Flor. Ind. 232.

Polypodium, &c. *Burm. Zeyl.* 196, *t.* 86.

Nat. of various parts of *India.*

8. *P. quercifolium.* Icon. Roxb. 14, t. 96.

Parasitic; barren fronds sessile, ovate-cordate, slightly pinnatifid; fertile ones long-stiped, and deeply divided into long sublinear segments. Fructifications scattered in numerous minute spots over the whole of the back of the leaves.

Pannæ-kelengo-maravara. *Rheed. Mal.* 12. *t.* 11.

Polypodium Indicum majus. *Rumph. Amb.* 6. *t.* 36.

Beng. Goroor.

Nat. of various parts of *India.* Is a large species, grows on trees, with slowly creeping, broad, thick, fleshy, scaly-tomentose shoots.

Root creeping, short, fleshy, covered with a thick coat of long, filiform, downy, scales.

Fronds of two sorts; viz. barren and fertile. *Barren* sessile, cordate sinuate, smooth, except for numerous beautifully reticulated veins. *Fertile* stand upon pretty long, half-round, smooth somewhat winged petioles, they are deeply pinnatifid; *pinnæ* alternate, tapering, smooth, entire.

Fructification in numerous dots over the back of the pinnæ.

Capsules most numerous, each supported on a long slender pedicel, subglobular, 4-5ths girt with a necklace-like elastic ring, 1-celled, 1-valved.

Seeds most numerous, of a bright shining gold colour.

9. *P. excavatum. R.* Icon. Roxb. 14, t. 97.

Fronds all long-stiped, from simple to deeply pinnatifid; laciniæ lanceolate, acute. Fructifications solitary, in two rows of very large, naked spots, lodged in deep concavities.

Polypodium Indicum glabrum. *Rumph. Amb. 6. t. 35. f. 2.*

Nat. of the *Moluccas.* Introduced into the Botanic Garden in 1798, where it fructifies during the rains.

Root creeping horizontally under the surface of the earth, about as thick as a stout rattan, with numerous, filiform, ramous, hard fibres issuing from them, and penetrating deep into the ground.

Stipes straight, smooth, round, from 6 to 12 inches long.

Fronds barren and fertile alike, oblong, pinnatifid; very smooth on both sides; from 12 to 18 inches long. *Laciniæ* ensiform or tongue-shaped, sometimes obtuse, sometimes pointed; sinuses rounded, margins most entire.

Fructifications in only two rows of naked, equally distant between the nerve and margin, distinct, rather remote, very large, round spots, lodged in deep hollows; which are equally conspicuous on the upper surface of the frond as on the under.

Involucre none.

Capsules pedicelled, 2-valved, girt, with a jointed elastic ring.

It has much the appearance of *Polypodium quercifolium*, but differs from it in many respects. The most obvious are,

1st. Here the root runs under ground, whereas *P. quercifolium* is parasitical, thick, fleshy, densely clothed with brown fibres.

2nd. Here the fronds are all stiped, and deeply pinnatifid, with only two rows of large naked fructifications on each pinnule. In the other, the barren fronds are sessile, and the fructification consists of numerous small dots scattered over the segments of the fertile fronds.

10. *P. semipinnatum. R.*

Stipes smooth; fronds smooth, composed of one or two distinct, remote pair of broad, variously-shaped segments below; and a large terminal, 3-lobed one. Fructifications in numerous, approximate, distinct spots, over the whole disk. Involucre obscure.

Nat. of the *Malay Islands.* Is very like my *Acrostichum semipinnatum.*

Section II.—*With compound leaves.*

Polypodium lucidum. R. Icon. Roxb. Suppl. 5, t. 2.

Fronds pinnate: stipes smooth, leaflets subalternate, sessile, linear-lanceolate, entire, smooth. Fructifications in a single line, of large, remote spots, on each side, half-way between the margin and nerve.

A native of *Nepaul*, from thence introduced into the Botanic Garden at *Calcutta*, by Dr. Buchanan in 1802; general height of the whole plant from 18 inches to 2 feet. Fructifies during the rains.

Shoots creeping, thick, and fleshy, pretty smooth, colour a deep green.

Fronds few, alternate, nearly erect, oval, from 1 to 2 feet long, stipe included; pinnate. *Leaflets* opposite, and alternate, sessile, narrow-lanceolate, with oblique tapering base, entire, smooth, and shining; of a thin but firm texture: the terminal one often bifid, or trifid, and those next to it more or less decurrent; general length from 4 to 6 inches.

Stipes from 6 to 12 inches long, round, and smooth.

Fructification in a single line, of remote, large, round spots, half-way between the margin and rib.

Involucre not discovered.

11. *P. flagelliferum. R.* Icon. Roxb. 14, t. 99. Aspidium flagelliferum. R. Wall. Cat. p. 67, No. 2234.

Shoots creeping under ground, stipes hairy; fronds sub-alternately pinnate, proliferous at top; leaflets broad, ensiform, crenate, and crenulate, smooth. Fructifications in one row, on each side, half-way between the nerve and margin. Involucre reniform.

Nat. of *Bengal.* Fructifying time the rainy season.

Root fibrous, and from the base of the stipes, where they unite, spring many, very long, slender runners.

Stipes a little woolly, particularly while young, and near the base, dark chesnut colour, furrowed on the anterior side; whole length, frond included, from 2 to 3 feet.

Fronds pinnate, terminating in an incurved, somewhat gemma-like knob, which strikes root, and produces other plants where it rests on the ground.

Pinnæ alternate, sessile, ensiform, with enlarged bases, the lower pairs, (and they extend down to near the base of the stipe,) broader, shorter, and sterile, with their margins slightly serrate. The superior pairs fertile, longer, narrower, and crenulate; all are smooth on both sides.

Fructifications in a single row of distinct dots on each side of the nerve.

Involucrum reniform.

12. *P. ferrugineum. R.*

Stipes and nerves clothed with much brown, scaly pubescence; fronds (3-5 feet high,) alternately pinnate; leaflets ensiform, base truncate, with the upper angle thereof rather enlarged, the fertile crenulate. Fructifications large, in a line near the margin. Involucre round.

Nat. of *Amboyna.*

13. *P. rupestre. R.*

Petioles smooth; fronds pinnate. (3-4 feet high,) smooth; leaflets subalternate, narrow-lanceolar, scarcely crenate. Fructifications solitary, (forming a line on each side the nerve, of rather remote dots.) Involucre obscure.

Nat. of *Pinang*, on mossy shaded rocks of granite.

14. *P. radicans. Burm.* Aspidium auriculatum Sw. Wall. Cat. p. 67, No. 2233.

Scandent, and supported by tendrils or roots, from short, remote, scaly, frond-bearing shoots. Fronds pinnate; sterile leaflets oblong; fertile ensiform, with base truncate, and there enlarged on the upper angle; all are obtuse. Fructifications in a line near the margin. Involucre round-reniform.

P. radicans. Burm. Fl. Ind. 233. *t.* 66. *f.* 3. is not unlike the sterile frond, and was most likely intended for the same plant.

Nat. of the *Malay Islands*, &c.

15. *P. unitum. Burm.* Icon. Roxb. 14, t. 100.

Stipes smooth; fronds (2-3 feet high,) pinnate; leaflets barren and fertile alike, ensiform, serrate, villous underneath. Fructifications generally scattered, and nearer the margin than the nerve. Involucre ciliate.

Filix Zeylanica. *Burm. Zeyl.* 1. 44, *f.* 1.

I doubt if this is Desfontaine's *Barbary* plant. His description does not well accord with our *East Indian* species. Here our leaflets are not pinnatifid, but serrate, with a single line of distinct spots, a little removed from the margin. It is probably a *Davallia* or *Dicksonia.* Unfortunately I neglected examining the involucre when I had it in my power.

16. *P. sophoroides. Thunb. in Linn. Trans.* 2. 341.

Fronds pinnate, a little hairy; leaflets ensiform, gashed-serrate. the lower pair of serratures longer; terminal one tapering to a fine serrated point. Fructifications sometimes in a single line of spots on each side of the nerve; sometimes they form a nearly continued line near the margins of the incisures.

Nat. of the *Moluccas*, &c. Fructifies during the rainy season.

17. *P. proliferum. R.* Icon. Roxb. 14, t. 101.

Fronds pinnate, drooping, and often ending in long creeping flagelli; leaflets opposite, and alternate, tapering from a truncated base, obtusely crenulate, smooth. Fructifications in lines parallel with the veins.

Beng. Depu.

Hind. Kull-ke-jaup.

Nat. of *Bengal*, and the more interior parts of *India.* Grows among brushwood, long grass, &c. in moist shady places about Calcutta; fructifies during the latter part of the rainy season.

Root creeping, flexuose, dark blackish rust colour, with many fibres of the same hue.

Stipe smooth, channelled, as thick as a quill; of various lengths according to soil, &c. the whole length of it and the fronds, including the tail, is often as much as 10-12 feet.

Fronds drooping, pinnate. Leaflets sessile, opposite, and alternate, sword-shaped, with an oblique cordate base; margins notched; notches lanceolate; both sides smooth, with numerous, beautiful, parallel, diverging veins, each ending in the apex of a notch; the largest are from 4 to 6 inches long, those of the tail small, often hastate or 3-lobed.

Tail. long, sarmentous.

Note.—In luxuriant plants the fronds are frequently ramous, that is here and there a similar frond growing from the axils of the leaflets.

Fructifications numerous, minute, approximate in parallel lines, one on each side of the diverging veins; each dot composed of a number of minute, pedicelled globules, girt with their brown crenulated, elastic rings; there is a constant succession of them for a length of time.

Note.—It may be *P. unitum*, as it agrees better with the Linnean definition of that plant, and with the figures in *Burman's Thesaurus Zylanicus*, and *Sloane's History of Jamaica*, than with the definition of *P. parasiticum*, though the figure of that species in *Rheede's Hortus Malabaricus* agrees with this plant tolerably well, the tail of the fronds excepted.

18. *P. acuminatum. R.*

Fronds alternately pinnate, smooth, (3-6 feet high;) leaflets ensiform, cuspidate, with base truncate, serrate, serratures very small, but distinct towards the top. Fructifications in lines parallel with the veins. Involucre minute, and soon disappears.

19. *P. mucronatum. R.*

Fronds alternately pinnate; stipes somewhat hairy; pinnæ ensiform, acutely serrate, finely acuminate. Fructifications in numerous minute spots, arranged in lines between the veins; no involucre.

A native of *Silhet.* In the Botanic Garden, at *Calcutta*, it grows obliquely to the height of about 2 feet, and fructifies during the cold season. The texture of the leaves is hard, and glossy: the apex quite ensiform, the serratures of a middling size, and very acute.

20. *P. tenerum. R.*

Fronds alternately-pinnate; pinnæ linear-lanceolate, gash-serrate, acuminate. Fructification in a few spots on each side of the veins: involucre reniform.

A native of *Silhet.* In the Botanic Garden at *Calcutta*, it grows to the height of from 12 to 18 inches, is of a delicate soft texture, and somewhat villous.

21. *P. cuspidatum. R.* P. urophyllum. Wall. Cat. 64, No. 299, (quod nomen delendum.)

Fronds alternately pinnate, (3-6 feet high;) leaflets alternate (6-12 inches long,) linear-lanceolate, cuspidate, bluntly serrate, smooth; the whole nearly equal in size. Fructifications in lines parallel with the veins, and running their whole length. Involucres none visible.

Nat. of *Pinang*, under the shade of lofty trees.

22. *P. semisagittatum. R.*

Base of the stipes scaly; fronds (6-18 inches high,) sub-oppositely-pinnate; leaflets serrate, smooth, the superior ensiform; the lower small, and triangular. Fructifications in numerous dots, parallel with the nerve of the segments. Involucres round, with a fissure on one side.

Nat. of the *Delta of the Ganges, Chittagong.* &c.

23. *P. involucratum. R.*

Stipes smooth; fronds alternately pinnate; leaflets remote, petiolate, lanceolar, cuspidate, margins waved. Fructifications in numerous spots, over the whole disk. Involucres very large, round, entire, permanent.

Nat. of *Amboyna.*

24. *P. nudatum. R.*

Fronds alternately pinnate; leaflets rather remote, sessile, smooth, incurve-ensiform, fine taper-pointed, rounded at the base, margins very equally serrate, the terminal one larger, but not more deeply serrate than the rest. Fructifications in numerous minute dots, in lines parallel with the veins. Involucres none.

Nat. of *Amboyna.*

25. *P. scabrum. R.* Wall. Cat. 66, No. 2225.

Stipes scabrous, and hirsute; fronds (6-12-feet high,) alternately pinnate; leaflets linear, most long, smooth on both sides, gash-serrate, fine-entire-pointed. Fructifications in 2 lines, of numerous, round spots, close to the nerves of the serrature of the pinnæ. Involucre uncertain.

Nat. of the tops of the highest mountains of *Amboyna.*

It differs from all I have yet found, in having the fructifications close to the veins, (nerves of the serratures or segments.)

26. *P. parasiticum.* Aspidium parasiticum, Hb. Madras, Wall. Cat. 67, No. 2239?

Stipes sometimes pubescent; fronds lanceolate, (3-4-feet high,) pinnate; leaflets subalternate, ensiform, pinnatafid (to the middle,) apices fine, and entire; barren segments obtuse, entire, the lower pair larger. Fructifications in two rows, parallel with the nerves of the segments. Involucres round-reniform.

Nat. of various parts of *India.* The above definition is taken from *Molucca* plants.

27. *P. longifolium R.*

Fronds linear, (3-4 feet high,) pinnate leaflets; alternate, and opposite, ensiform, pinnatifid, apices rather obtuse; entire, and fertile throughout; segments entire, incurved, obtuse. Fructifications in two lines, of numerous spots, parallel with the nerves of the segments. Involucre round-reniform, uncommonly permanent.

Nat. of *Amboyna.*

28. *P. acutum. R.*

Stipes smooth, channelled; fronds (3-4 feet high,) lanceolate, a little hairy, sub-bipinnate; leaflets subalternate, linear-lanceolate, and ensiform, pinnatifid to near the base; most acute, segments linear, incurved, entire, rather obtuse. Fructifications in two lines, parallel with the nerves of the segments. Involucre round, 2-lobed.

Nat. of *Amboyna.*

Differs from *P. longifolium,* in the leaflets having exceeding acute, sterile apices; and in being more deeply pinnatifid.

29. *P. pilosum. R.*

Fronds (12-18 inches high,) hairy bipinnate at the base, middle pinnate, top pinnatifid, leaflets acute, their lobes obtuse, and from entire to serrate, or even gashed. Fructifications scattered, or in two lines, parallel with the nerves of the segment. Involucre round.

Nat. of *Chittagong,* near the *Burning Wells.*

30. *P. dichotomum. Thunb. Fl. Jap.* 338. *t.* 37. good.

Fronds dichotomous, about half the divisions of the rachis naked, smooth; leaflets pectinato-pinnatifid; segments separated to very near the base, linear, diverging, obtuse. Fructifications in two lines, of minute spots, on the segments of the pinnæ.

Acrostichum furcatum. Linn. sp. 1529.

Nat. of the *Molucca Islands.*

31. *P. furcatum. R.*

Scandent. Fronds dichotomous, all the divisions (of the rachis) furnished with diverging, linear, pectinato-pinnatifid segments.

Found in the forests of *Pulo Pinang,* running over fallen trees, &c. &c. to a great extent.

32. *P. multiflorum. R.*

Stipes smooth. Fronds (6-8 feet high,) suboppositely, and alternately bipinnate below, and bipinnatifid, and finally pinnatifid towards the top; leaflets remote, fertile fine pointed; segments thereof subensiform; the larger gashed, the smaller crenate. Fructifications numerous, scattered, (almost confluent.) Involucre uncertain.

Nat. of *Amboyna.*

33. *P. confertum. R.*

Stipes smooth, erect, (3-4 feet high,) fronds from bipinnate below, to bipinnatifid, and finally pinnatifid towards the top ; leaflets rather remote, sublinear, fine-fertile-pointed ; segments broad-ensiform, somewhat incurved, from gashed to obscurely crenate. Fructifications in numerous, large, crowded spots, covering the whole of the back of the frond.

Found by Mr. Roxburgh in *Chittagong*, under the shade of trees.

34. *P. confluens. R.*

Stipes scaly : fronds (1-2 feet high,) smooth, bipinnate at the base, becoming less compound to the obtuse pinnatifid apex ; pinnæ tapering ; segments thereof obtuse, linear, confluent, from entire to serrate, or even pinnatifid. Fructifications in two lines parallel with the nerves of the segments.

Nat. of *Chittagong.*

35. *P. squarrosum. R.*

Stipes to the top of the frond clothed with long, brown, ragged scales and hairs ; fronds linear, alternately-bipinnate, (2-3 feet high :) pinnæ linear ; leaflets subtriangular, mucronate, and acutely jagged, particularly on the anterior margin. Fructifications few, and large, in two rows. Involucre peltate.

Found by Captain Hardwicke on the tops of the mountains between *Hurdwar* and *Sirinagur.*

36. *P. scariosum. R.*

Stipes clothed with scariose, scaly hairs to the top of the fronds (which are 3-5 feet high,) subalternately bipinnate : pinnæ sublanceolate ; leaflets trapeziform, crenate-serrate, smooth. Fructifications scattered, numerous, large. Involucre obscure.

Nat. of *Amboyna.*

37. *P. impuber. R.*

Stipes smooth ; fronds (5-6 feet high,) alternately bipinnate ; pinnæ linear, ending in fine, serrated, barren points ; leaflets oblong, obtuse, entire, smooth ; on the lower half of the pinnæ distinct ; on the exterior confluent. Fructifications in two lines, parallel with the nerve of the leaflets. Involucre obscure.

Nat. of *Amboyna ;* an elegant, firm, polished species.

38. *P. affine. Forst. Flor. Austr. p.* 83.

Stipes with large scariose scales at the base ; fronds (3-4 feet high,) alternately bipinnate ; pinnæ tapering ; leaflets linear-oblong, obtuse, smooth, to the middle pinnatifid. Fructifications somewhat scattered, inserted amongst hairs, on elevated receptacles. Involucre obscure.

Nat. of *Amboyna.*

39. *P. elatum. R.*

Stipes smooth ; fronds (many feet high,) alternately tripinnatifid ; pinnæ linear, fine serrate ; barren pointed, leaflets ensiform ; fertile pointed, pinnatifid ; segments thereof incurved, scarce serrulate, obtuse. Fructifications large, in a crowded line, near the margin of the segments. Involucre obscure.

Nat. of *Amboyna.*

40. *P. tridentatum. R.*

Stipes smooth. Fronds (of a delicate texture, 2-4 feet high,) alternately tri-pinnatifid ; pinnæ linear, tapering to most fine, long, serrate points ; leaflets of nearly the same form, and deeply pinnatifid ; segments thereof linear, serrate, with dentate apices. Fructifications remote and small, in two rows of solitary spots near the base of each of the segments of the leaflets. Involucre obscure.

Nat. of the *Island of Banda ;* an elegant, finely-divided plant, of a soft, delicate texture.

41. *P. arborescens. R.* P. arboreum. Hb. Roxb. Wall. Cat. 66, No. 2226 ?

Arborescent. Stipes smooth ; fronds alternately tri-pinnatifid ; pinnæ linear, ending in long, fine, crenate, fertile points ; leaflets ensiform, fertile-pointed, to the base pinnatifid, segments thereof linear-oblong, incurved. Fructifications in a line of dots, on each side of the nerve of the segments of the leaflets. Involucre obscure.

Nat. of the *Island of Honimoa,* one of the *Moluccas ;* yet I cannot think *Rumphius's Palmifilix,* Hb. Amb. vol. 6, t. 27, is the same.

42. *P. felinum. R.*

Scandent. Stipes rough with minute prickles, (like the tongue of a cat ;) fronds alternately tri-pinnatifid ; pinnæ, linear, (2-3 feet long ;) leaflets broad-ensiform, with serrate, barren points ; near the base often pinnate, the rest deeply pinnatifid ; segments thereof linear, crenulate, obtuse, incurved. Fructifications in two crowded lines, parallel with and close to the nerve of the segments. Involucre obscure.

Nat. of *Amboyna* and *Pullo Pinang,* climbing, in open situations, over fallen trees, &c.

43. *P. dubium R.* Davallia Roxburghii. Wall. Cat. 66, No. 2218.

Fronds alternately quadri-pinnatifid, smooth, (several feet high ;) its ultimate divisions obtuse, tending to be trapeziform, and more or less deeply gashed. Fructifications in solitary spots at the bottom of the fissures of the leaflets. Involucre opens on the anterior margin, forming a pouch.

Nat. of the *Moluccas.* Is probably a *Davallia.*

44. *P. æmulum. Ait. Kew.* 3. 466.

Fronds quadri-pinnatifid, smooth, and delicate ; ultimate divisions narrow-trapeziform oblong, sides pinnatifid, or gashed and denticulate at tip. Fructifications solitary on the segments. Involucre reniform, peltate and ciliate.

Nat. of the mountains north of *Rohilcund.*

10. ASPLENIUM.

Fructifications disposed in straight, subparallel lines. *Involucre* originating laterally from a vein, and separating inwards.

1. *A. Nidus. Linn.* Wall. Cat. 63, No. 198.

Fronds simple (1-3 feet,) subsessile, linear-lanceolate, entire, glossy; veins numerous and parallel. Fructifications in approximated lines, with a very conspicuous involucre, separating upwards and inwards, (that is, towards the apex of the leaf.)

Nat. of *Chittagong, Malay Islands, &c.* It grows in large compact bowl-shaped tufts, not unlike a bird's nest; the specific name is therefore particularly appropriate.

2. *A. reticulatum.* R. Grammitis macrophylla. Wall. Cat. 61, No. 10.

Fronds simple, (1-2 feet,) subsessile, lanceolate, entire, smooth, with reticulated veins. Fructifications in rather remote parallel lines. Involucre not visible.

Nat. of the *Malay Islands.*

3. *A. linguæforme. R.*

Stipes long, and polished; fronds tongue-shaped, entire, smooth. Fructifications in numerous, approximated lines, over the whole disk, and extending almost to the margin. (Involucre not visible in the dry specimens.)

Nat. of the *Moluccas.*

4. *A. monanthemoides. R.*

Stipes polished, round, with a groove; fronds (6-12 inches high,) alternately-pinnate; leaflets delicate, smooth, trapeziform, very obtuse, anterior and exterior margins dentate-serrate; posterior entire. Fructifications in short lines, on both sides of the nerve; when the involucre expands they become round, (as in *Polypodium.)*

Nat. of *Chittagong.*

5. *A. trapeziforme. R.* Wall. Cat. 66, No. 2213.

Stipes polished; fronds (12-18 inches,) alternately pinnate; leaflets trapeziform, very obtuse, serrate, except a small portion of the posterior margin near the base, smooth. Fructifications in many lines, on both sides of the nerve. Involucre separating inwards.

Nat. of the *Malay Islands.*

6. *A. coriaceum. R.* Asplenium Finlaysonianum. Wall. 63, No. 191, (quod nomen delendum.)

Stipes smooth; fronds (1-2 feet high,) alternately pinnate; leaflets obliquely-ovate ensiform-falcate, remotely serrate, smooth, coriaceous. Fructifications in numerous parallel lines, over the whole of the disk. Involucre very conspicuous.

Nat. of the *Malay Islands.*

7. *A. serrulatum. R.*

Stipes smooth; fronds (2-3 feet high,) alternately pinnate; leaflets (about 15) smooth; broad-ensiform, margins remotely serrulate; inner upper angle enlarged; terminal lobe larger, and pinnatifid. Fructifications in lines, on the (secondary) veins, of which the lower are often double. Involucre single or double, according with the lines.

Nat. of *Amboyna* and other *Malay Islands.*

8. *A. crenatum. R.*

Stipes smooth; fronds smooth; (several feet high,) alternately pinnate; leaflets linear-ensiform, elegantly crenate, (6-9 inches long.) Fructifications in numerous double and single lines, on the (secondary) veins. Involucre double or single.

Nat. of the *Malay Islands.*

9. *A. cultrifolium. Linn.*

Stipes smooth, grooved; fronds (2- 4 feet high,) suboppositely pinnate; leaflets lanceolate-falcate, taper-pointed, gash-serrate, firm and smooth. Fructifications in rather remote, longish, parallel lines. Involucre separating inwards.

Nat. of *Amboyna.*

10. *A. varium. R.*

Fronds alternately-pinnate; leaflets from ensiform to linear, and obtuse, smooth, largely-crenate, inner crenature on the upperside very large. Fructifications in various sized single and double lines. Involucre single and double, each separating outwards.

Nat. of *Amboyna.*

11. *A. hemionitoides. R.*

Stipes pretty smooth; fronds lanceolate, alternately pinnate; leaflets falcate, obtuse, the lower pinnatifid; the upper more or less crenate-serrate, inner crenature on the upper side larger. Fructifications generally in double lines, with a vein between them. Involucres double.

Nat. of the *Malay Islands.*

In the double lines and *involucres*, it approaches to Smith's character of *Hemionitis.*

12. *A. mixtum. R.*

Stipes smooth; fronds lanceolate, alternately pinnate; leaflets ensiform, with tapering, serrate, fertile points, the rest more or less pinnatifid, with the segments thereof rounded. Fructifications in short lines, on the veins of the segments; the lower one, at least, always double. Involucre in the single lines, separating inwards; in the double, both ways.

Nat. of *Amboyna.*

13. *A. multiflorum. R.*

Fronds pinnate, (3-6 feet high,) with angular, hairy petiole; leaflets numerous, alternate, ensiform, pinnatifid. Fructifications in two rows, of short, parallel, single lines on the veins of the segments of the pinnæ. Involucre separating on the side next the nerve of the segment.

Nat. of the *Malay Islands*, under the shade of trees.

14. *A. bipinnatum.* R. Icon. Roxb. Suppl. 5, t. 1.

Fronds alternately-bipinnate. (3-4 feet high;) pinnæ remote, recurved; leaflets broad-ensiform, smooth, remotely crenate, truncate at the base. Fructifications in minute, single, parallel lines, on the veins of the segments of the leaflets. Involucre separating inwards.

Nat. of *Amboyna*, but introduced into the Botanic Garden at *Calcutta*, where it *fructifies* during the rains.

Root, the united bases of the stipes form something like a very short, oblique, ragged, blackish one, or a *trunk*, which sends forth numerous radical fibres into the ground.

Stipes 18 inches long, nearly 4-sided; upper side grooved, toward the base somewhat scaly, otherwise they are smooth.

Fronds alternately bipinnate, ovate-oblong, 2-3 feet long. *Pinnæ* alternate, 8-12 inches long. *Pinnules* sub-opposite and alternate, sessile, ensiform, crenate, base truncate, smooth, 2-3 inches long.

Fructifications in parallel lines.

Involucre originating from a vein, separating inwards or both ways.

15. *A. cicutarium. Linn.*

Shoots creeping, scaly. Stipes alternate, polished; fronds alternately subtripinnate, as broad as long, (6-8 inches high;) ultimate divisions subovate, with the anterior margins crenate-dentate, firm, and smooth on both sides.

Nat. of the mountains north of *Rohilcund*.

16. *A. tripinnatum. R.*

Stipes polished, grooved; fronds (2 feet high,) alternately tripinnate; ultimate divisions thereof wedge-shaped with their apices præmorse, deeply notched, and generally two or three-flowered.

Nat. of the *Molucca Islands*.

17. *A. woodwardioides. R.*

Stipes smooth; fronds (2 feet high,) subovate, smooth, alternately-bipinnate; leaflets broad-ensiform; those of the inferior pinnæ pinnatifid; of the upper more or less serrate. Fructifications in oblong spots along the nerve, but forming a sharp angle with it. Involucre separating towards the nerve.

Found at *Chittagong* by Dr. Buchanan.

11. HEMIONITIS.

Fructifications digested in scattered or branched lines, each of them double, with a vein running between. *Involucre* originating from a vein, and each separating outwards.

1. *H. cordifolia, R.* Icon. Roxb. 14, t. 103.

Fronds cordate, obtuse, entire. Lines of the fructifications decussated, forming rhomboidal interstices.

Beng. Chacooly.

Nat. of *Bengal*. Grows in a rich wet soil about Calcutta.

Root fibrous, perennial.

Fronds oblong-cordate, obtuse, entire; smooth on the upper surface, a little hairy underneath; from 3 to 6 inches long; the fructiferous fronds smallest, and on much longer stipes.

Stipes slender, channelled, woolly, dark purple; from 2 to 12 inches long.

Lines of the fructification decussating, numerous over the whole underside of the fronds, leaving but small oblong interstices.

Capsules most numerous, short pedicelled, girt with an elastic ring.

Seeds very numerous.

2. *H. reticulata. R.* Antrophyum reticulatum. Kaulf. Wall. Cat. 61, No. 40.

Fronds in tufts, sessile, cuneate-lanceolate, entire. Nerve vanishing towards the middle of the frond; veins and lines of the fructification reticulated, forming sublanceolate interstices.

Nat. of the *Moluccas*.

12. SCOLOPENDRIUM.

Fructifications in scattered double lines, placed between two veins. *Involucre* originating from the surface, (or rather from the veins,) lying over one another longitudinally, and separating by a longitudinal suture. *Smith.*

S. lanceolatum. R.

Parasitical, creeping. Stipes polished. Fronds lanceolate, entire, acute, the barren greatly larger, and with shorter stipes.

Nat. of *Chittagong*.

13. BLECHNUM.

Fructifications disposed in two-parallel lines, approaching the nerve. *Involucre* originating from the surface, continued; separating towards the nerve.

1. *B. angustifolium. R.*

Stipes polished, as long as the simple, linear-lanceolate, entire, smooth fronds. Fructifications in an uninterrupted line, half-way between the nerve and margin. Involucre obscure.

Nat. of the *Moluccas*, grows about 12 or 18 inches high.

2. *B. glabrum. R.* Tænitis blechnoides. Sw. Wall. Cat. 62, No. 141.

Stipes smooth. Fronds (3-4 feet high,) suboppositely pinnate; leaflets short-petioled, linear-lanceolate, entire, rather obtuse, firm and smooth. Fructifications in an uninterrupted line, half-way between the nerve and margin. Involucre obscure.

Nat. of *Prince of Wales' Island*, where it is found growing under the shade of lofty trees.

3. *B. decurrens. R.*

Stipes smooth; fronds alternately pinnate; leaflets (above a foot long,) linear, sessile, attenuated at the base, and decurrent. Lines of the fructification close to the nerve.

Found by Dr. Hunter, on *Prince of Wales' Island.*

4. *B. moluccanum. R.* Blechnum orientale, Linn. Wall. Cat. 61, No. 57.

Stipes smooth. Fronds (6-9 feet high,) alternately pinnate; leaflets ensiform, firm, smooth, and entire. Fructifications close to the nerve of the leaflets. Involucre of a very firm texture, and separating from the nerve.

Nat. of *Prince of Wales Islands, Moluccas, &c.*

14. PTERIS.

Fructifications in an uninterrupted marginal line. *Involucre* from the margin of the frond, turned in uninterrupted, separating on the inner side.

P. graminifolia. R. Icon. Roxb. 14, t. 104, f. 3.

Parasitic. Fronds linear, very long (2-3 feet) entire pendulous.

Nat. of the close dark forests of *Silhet*, where it is found suspended on trees, resembling long tufts of long, narrow-leaved grass.

P. angustifolia. Swartz. Icon. Roxb. 14, t. 104, f. 2.

Parasitic, creeping. Fronds (4-6 inches,) subsessile, simple, linear-lanceolar, acute, smooth. Fructification occupying the whole margin.

Nat. of the *Delta of the Ganges*, where it is found growing on the trunks of trees, intermixed with mosses, &c. parasitic plants, of various kinds.

Stems creeping, but short, and covered with much dark brown long hair.

Stipes short, roundish.

Fronds linear-lanceolate, smooth on both sides; from 4 to 12 inches long.

Fructifications in a continued marginal line.

Involucre, a continuation of the epidermis of the upper surface of the frond, reflected over the capsules, and until they are ripe adhering to the under surfaces.

2. *P. piloselloides. Linn. Sp. Pl. Banks. ic. Kæmpf. t.* 31. Icon. Roxb. 14, t. 104, f. 1.

Parasitic, creeping, filiform. Fronds subsessile, succulent, veinless, obtuse, entire; barren from oval to oblong; fertile linear.

Nat. of *Chittagong*, creeping upon the trunks of trees.

Stems and *branches* filiform, equally thick throughout, climbing on trees, and rooting like *Ivy*, many feet in length.

Leaves subsessile, succulent, veinless, obtuse; the barren from round to oblong, and perfectly entire; length about an inch, *fertile* linear, and linear-lanceolate; length from 2 to 4 inches.

Fructification in an entire marginal line, even round the obtuse apices, and down to near the base. Involucre fleshy.

3. *P. lobata. R.*

Petioles smooth, nearly as long as the thin, polished, 2 or 3-lobed fronds.

Nat. of the *Moluccas.*

4. *P. vittata. Osb. It. t.* 4. Icon. Roxb. 14, t. 105. Pteris longifolia. Linn. Wall. Cat. 62, No. 111.

Stipes alternate, from a creeping root, polished. Fronds alternately pinnate, (2-5 feet high); leaflets sessile, ensiform, all the sterile parts have their margins waved and spinulose. Fructifications occupy the lower two-thirds, or more.

Nat. of the *Delta of the Ganges, &c.* Fructifies in the Botanic Garden most part of the year.

Root (or rather *stem*) creeping under ground.

Stipes springing alternate from the creeping root or stem, polished, channelled, dark brown; whole length, frond included, from 2 to 4 feet.

Fronds pinnate with an odd one, 2-3 feet long, smooth. *Pinnæ* sub-opposite, sessile, ensiform, tapering to a very long fine point; margins of the fertile (pinnæ as far as they are so) straight and entire, of the sterile waved and serrulate, the serratures often end in sharp cartilaginous points; all are smooth, and shining on both sides.

Fructifications in an uninterrupted marginal line, extending from the base for about two-thirds or more of the (fertile) pinnæ.

Involucrum from the margin of the pinnæ turned in, uninterrupted, separating on the inner side.

To *Pteris amplexicaulis* (now before me): this comes the nearest of any other I have

hitherto met with, yet differs essentially.

1st. Here (in *P. vittata*) the stipes rise single from the creeping stem, and are long and polished. There (in *P. amplexicaulis*) they grow in tufts and are short, and when old, scabrous; when young, woolly.

2nd. Here the pinnæ are not enlarged into a stipe-clasping base; taper to a very long fine point, and are (in general) fertile for only about two-thirds their length. There they have enlarged stipe-clasping bases, are rather obtuse pointed, and are fertile almost to the very points.

5. *P. amplexicaulis. R.* Icon. Roxb. 14, t. 106. P. amplectens. Wall. Cat. 62, No. 112, (quod nomen delendum.)

Stipes in tufts, short, somewhat rough. Fronds oblong, (about 2 feet high,) alternately pinnate, smooth; leaflets sessile, ensiform, rather obtuse, with two enlarged, stipe-clasping, rounded lobes at the base; the barren most finely serrulate; the terminal one greatly longer than the rest. Fructifications occupy the whole margin, except the very apices.

Nat. of *Bengal*, in shady, moist places. Also among ruins of brick buildings. Is sometimes parasitical.

Stipes short, on the forepart channelled, woolly, from 1 to 2 feet long.

Frond linear-oblong, pinnate with an odd one, leaflets below opposite; above frequently alternate; all are sessile, linear, entire, smooth; at the base broadest, and there obliquely cordate, from 2 to 3 inches long, and from ¼ to ½ an inch broad; in small plants the terminal one is often as long, or even longer, than the rest of the frond.

Note.—In a good soil, amongst brushwood, or long grass I have found them 3-4 feet high, the terminal leaflet is then as short, or shorter than the rest.

6. *P. linearis. R.*

Stipes rough. Fronds alternately-pinnate, (4-5 feet high;) leaflets linear, entire, very long, smooth, both sides rounded, and greatly protruded at the base. Fructifications occupy the whole margins, and when most expanded, leave very little of the naked pinnæ to be seen.

Nat. of *Amboyna.*

7. *P. scandens. R.* Icon. Roxb. 14, t. 107. Lomaria scandens. Willd. Wall. Cat. 6, No. 36.

Stem creeping up, and over large trees. Stipes somewhat armed. Fronds alternately-pinnate; sterile leaflets linear-lanceolate, acutely-serrate, cuspidate; fertile filiform.

Filix non ramosa, &c. *Burm. Zeylan. p.* 100, *t.* 46, good for part of a barren leaf only.

Panna valli. *Rheed. Mal.* 12, *t.* 35, the barren leaves.

Nat. of various parts of *India*; very old plants only fructify during the rains; and when the *involucre* is fairly open, it may be taken for an *Acrostichum.*

Stems about as thick as a ratan, creeping up, and over trees of the first magnitude, flexuose, angular, tolerably smooth, except for little, rather sharp, warty prickles scattered over every part.

Stipes alternate, grooved on the upper sides, smooth, except for a few very minute prickles; length to the pinnæ from 6 to 12 inches.

Fronds pinnate, about 3 feet long, drooping a little.

Leaflets (pinnæ,) from ten to twenty pair, alternate, sub-sessile. The *barren* lanceolate, long, taper, acute pointed, and most acutely serrate, smooth on both sides, veins numerous, very fine, and nearly diverging; general length from 6 to 9 inches, and about 1 inch broad. *Fertile* leaflets before the involucre opens filiform, after the capsules begin to burst, they become considerably broader; if found in this state only, it may be taken for an *Acrostichum*, and when still more advanced, the edges of the leaflets and involucre become involute, exposing the numerous minute capsules as if it were in a spike.

Involucre uncertain.

8. *P. lunulata. Retz. Obs.* 2, *No.* 99, *t.* 4. Adiantum lunulatum. Burm. Wall. Cat. 61, No. 77.

Stipes in tufts, polished, black. Fronds (6-18 inches,) longer than the petioles, recurved, alternately pinnate; leaflets petioled, somewhat crescent-shaped, smooth.

Avenka. *Rheed. Mal.* 12, *t.* 40.

Hind. Kull-k'ha.

Common in most parts of *India*, sometimes the margin is broken, when it resembles an *Adiantum*, and is very like *A. lunulatum*, but at all times sufficiently distinct.

9. *P. multifida. R.*

Stipes polished, black-purple; barren fronds cordate-lobate; fertile very long-petioled, pedato-bipinnatifid, with long, ensiform, acute segments.

A terrestrial, elegant species. The barren fronds about a foot high; the fertile from 2 to 3 feet. It is a native of the province of *Chittagong.*

10. *P. dimidiata. R.* Pteris semipinnata. Linn. Wall. Cat. 62. No. 97.

Stipes polished, brown, fronds alternately-semi-bipinnate, smooth, (about 3 feet high;) leaflets halved, linear, and entire on the upper side of the nerve; broad and pinnate, or deeply pinnatifid on the under; segments thereof entire, linear-oblong. Fructifications round the whole margins.

Nat. of *Chittagong.* Is one of the most beautiful Ferns I have ever seen.

11. *P. bicolor. R.* Cheilanthes dealbata. Wall. Cat. 61, No. 71.

Stipes polished, dark brown, filiform; fronds (3-12 inches high,) bipinnatifid; pinnæ opposite, pinnatifid; segments obtuse, crenate, green above, perfectly white underneath. Involucre brown, with lacerated margin.

Nat. of the mountains north of *Rohilcund.*

12. *P. pectinata. R.*

Stipes smooth ; fronds subbipinnate, smooth ; pinnæ few, opposite ; segments thereof entire, linear, falcate, obtuse, confluent. Fructifications occupy the whole of the margins, except the very apex.

Nat. of the *Moluccas.*

13. *P. quadriaurita. Retz. Obs.* 6, *N.* 86.

Stipes somewhat scabrous ; fronds opposite, and alternately-bipinnatifid, (3 or 4 feet high, and the petioles about as much more,) smooth ; pinnæ linear ; the lower pair sometimes doubled, deeply (almost quite to the nerve,) pinnatifid ; segments thereof falcate, obtuse, entire, the terminal one ensiform, and when barren crenate.

Nat. of the *Moluccas.*

14. *P. gracilis. R.*

Stipes smooth ; fronds decursively, suboppositely bipinnate ; pinnæ few and remote ; barren leaflets elliptically-lanceolar, and acutely serrate ; fertile linear, and many times longer than the barren.

A terrestrial species, a native of *Chittagong.* The fertile fronds are very slender, and about 20 inches high ; the barren little more than half of that.

15. *P. tripinnatifida. R.*

Stipes polished ; fronds (3-4 feet high,) smooth, oppositely tripinnatifid ; pinnæ broad-ensiform, with more or less deep, rounded triangular breaks and lobes. Fructifications in a very completely continued line, round every part of the margin.

Nat. of the *Moluccas.*

16. *P. pedatifida. R.*

Stipes trifid, with the lateral branches again bifid ; or trifid, all the divisions thereof bipinnatifid ; pinnules linear, deeply pinnatifid ; segments thereof linear-oblong, obtuse. Fructifications in a continued line, on the sides of the segments.

Nat. of *Amboyna,* and the *Malay Islands,* where it grows to be several feet high.

17. *P. daucifolia. R.*

Stipes smooth ; fronds ovate, (about 12 inches high,) alternately superdecompound ; its ultimate divisions minute and linear, almost entirely occupied by the fructifications.

Nat. of the Eastern parts of *Bengal.*

18. *P. succulenta. R.* Icon. Roxb. 14, t. 108. Acrostichum thalictroides et siliquosum. Roxb. Ceratopteris thalictroides. Brongn. Wall. Cat. 61, No. 81.

Annual, succulent. Fronds (from 2 inches to 5 feet high ;) the barren decompound, with ultimate divisions broad, and variously lobate ; the fertile super-decompound, with ultimate divisions linear.

Junglee Jhow of the Bengalis.

Nat. of various parts of *India,* in wet places.

Root fibrous, dark brown annual.

Stipes between quadrangular and half round, sulcated.

Fronds, barren pinnate, with pinnatifid leaflets. Fertile generally super-decompound ; *divisions* alternate ; *leaflets* subulate, furrowed on the back, smooth ; whole length (stipe included,) from 4 inches to 4 feet.

Fructifications in a line of numerous, distinct capsules, until ripe, completely hid under the entirely reflected margins of the leaflets.

Capsules sessile, globular, girt with the usual elastic ring.

Seeds (or globules,) about 20 in each capsule.

15. VITTARIA.

Fructifications in an uninterrupted marginal line. *Involucre* double, uninterrupted ; one from the surface separating outwards ; the other from the margin of the frond turned in, separating inwards.

1. *V. lineata. Smith.* Icon. Roxb. 14, t. 109.

Parasitic, stipes very short, compressed ; fronds both fertile and sterile linear, entire, smooth, (from 4 to 8 inches long.)

Pteris lineata. Linn.

Nat. of *Prince of Wales' Island* : thence introduced into the Botanic Garden by Mr. W. Roxburgh, Jun.

Parasitic with numerous fibrous roots, adhering to the bark of trees or putrid wood.

Stem scarce any.

Stipes very short, compressed, smooth.

Fronds linear-lanceolate, entire, acute, smooth, and slender, like a blade of grass ; about 6 inches long, and less than half an inch broad ; the barren and fertile are alike in shape and size.

Fructification in an uninterrupted line, on the anterior margins ; that is, from the middle of the frond to within half an inch, or an inch of the apex, with a double involucre.

2. *V. divergens. R.* Wall. Cat. 65, No. 2191.

Stipes polished, black. Fronds linear, (12-15 inches high,) alternately-pinnate ; leaflets subensiform, obtuse, approximate, diverging, enlarged at the base on the upper angle. (Fructifications as in *Pteris,* but with double involucre.)

Nat. of *Prince of Wales' Island,* where Mr. W. Roxburgh, Jun. found it growing in cool shady places.

3. *V. resecta. R.*

Stipes smooth ; fronds oblique, (6-12 inches high,) alternately pinnate ; leaflets sessile, subtrapeziform, obtuse, smooth. (Fructifications in a continued line on the anterior margin and round the apex. Involucre double.)

Nat. of *Chittagong.*

4. *V. lunulata. R.*

Fronds subsessile, linear, (6-12 inches high,) straight, alternately pinnate ; leaflets sessile, approximate, (touching,) crescent-shaped, with inner edge straight. (Fructifications in a continued line, on the anterior and exterior margins. Involucre double.)

Nat. of *Prince of Wales' Island.*

5. *V. parasitica. R.* Lindsæa parasitica. R. Wall. Cat. 65, No. 2196.

Parasitical. Stipes short, smooth, alternate on the creeping stem. Fronds oblong, alternately bipinnate, (about 2 feet high ;) pinnæ linear ; leaflets small, sessile, approximate, subtriangular, with the anterior side or margin, where the line of fructifications is found, circular. (Involucre double.)

Nat. of *Prince of Wales' Island,* where it was found by Mr. W. Roxburgh, Jun. growing on the trunks of trees.

6. *V. interrupta. R.* Lindsæa interrupta. R. Wall. Cat. 65, No. 2195.

Stipes polished, as long, or longer than the smooth, alternately bipinnate frond ; pinnæ linear ; leaflets triangularly-wedged-shaped, with anterior margin, chiefly of the barren fronds, gash-dentate. Line of fructifications on the anterior margin, and interrupted by the breaks therein. (Involucre double.)

Found by Mr. W. Roxburgh, growing on the ground, in shady cool places on *Prince of Wales' Island.*

16. LINDSÆA.

Fructifications in an uninterrupted line, a little removed from the margin. *Involucre* originating from the surface, continued ; separating outwards.

1. *L. odorata. R.* Icon. Roxb. 14, 109.

Stipes alternate from a creeping root, smooth ; fronds alternately-pinnate ; leaflets petioled, trapeziform-falcate, anterior margin gashed.

An elegant, small, erect species, of from 6 to 12 inches in height ; a native of the *Garrow Hills ;* when dry and drying, sweetly fragrant. The line of fructification is completely marginal, and interrupted by the fissures on the anterior margin of the leaflets, and I would rather be inclined to consider it a *Hymenophyllum,* if any thing like a column could be found within the involucre.

2. *L. bipinnata. R.*

Fronds alternately bipinnate, smooth ; pinnæ linear ; leaflets sub-sessile, somewhat crescent-shaped, with an uninterrupted line of fructifications, a very little removed from the anterior-exterior margin. (Involucre originating from the surface, continued, separating outwards.)

Found by Mr. W. Roxburgh on *Prince of Wales' Island.* I am not certain if ever the thin edge of the leaf is turned in (over the inner) involucre. I am rather inclined to think not ; at least I have not been able to discover that it is.

It is exceeding like *Vittaria parasitica,* and only a little larger, and more robust.

17. ADIANTUM.

Fructifications in roundish, separate, marginal spots ; under, (and inserted into,) the reflected involucre-like tips of the margin of the fronds which separate inwards.

1. *A. proliferum. R.* A. flagelliferum. Wall. Cat. 61, No. 76, (quod nomen delendum.)

Stipes filiform, hairy ; fronds (6-12 inches long,) alternately-pinnate, tailed at top, and there proliferous ; leaflets triangular, anterior margin præmorse, and more or less divided.

Nat. of the *Moluccas.*

2. *A. caudatum. Mant.* 308. Icon. Roxb. 14. t. 110.

Stipes purple and hairy ; fronds (6-12 inches long,) alternately-pinnate, tailed at top, and there proliferous ; pinnæ subtrapeziform gashed. Fructifications under the reflected apices of the divisions of the pinnæ.

Adiantum caule reflexo. *Burm. Zeyl. t.* 5. *f.* 1. has the leaflets longer and narrower than I have met with.

Nat. of *Hindoostan* as well as *Ceylon.*

Root perennial.

Stem none.

Fronds simply pinnate, slender, reclined, about a foot long ; apex often leafless, and striking root.

Stipes a little villous, round.

Leaflets alternate, subsessile, subtrapeziform, the anterior-exterior margin from three to six cleft, (with the fructifications on the exterior margins of these divisions,) posterior and inner margins entire, striated, somewhat villous, length generally under an inch, and about half as much in breadth.

Fructifications, a large oblong cluster of minute capsules, on the under edge of the margin of the divisions of the leaflets.

Involucre simple, separating on the inner side, being a continuation of the segments of the leaflets.

3. *A. tenerum. R.* A. Capillus. Linn. Wall. Cat. 61, No. 73.

Stipes polished black; fronds (6-12 inches high,) alternately bi-tripinnate; its ultimate divisions fine-petioled, triangularly wedge-shaped, and often deeply cut on the anterior, irregularly rounded margin.

Found on the northern boundary of *Oude*, by Mr. A. Gott. It is very like Dryander's *Lindsæa tenera. Trans. Linn. Soc.* 3, p. 42, t. 10.

4. *A. microphyllum. R.* A. venustum. Don. Wall. Cat. 61, No. 81.

Stipes highly polished, deep brown. Fronds (12-18 inches high,) super-decompound; its ultimate divisions round-wedge-shaped; anterior margin minutely dentate. Fructifications from 1 to 3, though generally solitary, on the anterior edge.

Nat. of the mountains north of *Rohilcund.*

In my generic character of this genus, I have observed that the little annulated capsules, are inserted on the involucre itself, such being the case in all the above four species.

18. DAVALLIA. *(Smith.)*

Fructifications in roundish, separate spots, near the margin. *Involucres* like scales, from the surface, distinct, separating outwards.

1. *D. angustifolia. R.* D. angustata, Wall. Cat. 63, No. 242, (quod nomen delendum.)

Parasitic, creeping. Fronds sessile; both barren and fertile linear-lanceolate, serrulate, firm and polished. Involucres like scales.

Nat. of *Prince of Wales' Island*, and found by Mr. W. Roxburgh, running to a great extent up the trunks of trees.

2. *D. longifolia. R.*

Fronds linear, pectinato-pinnatifid, firm, though a little villous on the upper surface; segments linear, obtuse, with about three fructifications just under their apices. Involucre like a pouch.

Found, by Mr. W. Roxburgh, growing on well-shaped rocks on *Prince of Wales' Island.*

3. *D. pectinata. Smith.*

Creeping; petioles scaly. Fronds (about six inches high,) ovate-oblong, firm, and smooth, to the nerve pectinato-pinnatifid; segments linear, obtuse, almost entire. Fructifications in a row of numerous approximated dots, between the nerve of the segment and their margin. Involucres like scales.

Found on the northern boundary of *Oude*, by A. Gott.

Filix polypodium, &c. *Pluk. t.* 289, *f.* 1 and 2, are exceeding like my plant.

4. *D. cordifolia. R.*

Creeping, petioles smooth, fronds about 6 inches high, long-cordate, polished, and very firm, oppositely pinnate; leaflets confluent falcate, obtuse, deeply crenate; the lower pair semi-cordate. Fructifications marginal, with very distinct, roundish, hard scaly involucres.

Nat. of the mountains north of *Rohilcund.* The habit of this species is remarkably hard and smooth.

5. *D. serrata. R.*

Rachis 3-sided. Fronds alternately pinnate; leaflets linear, firm and smooth, serrate. Fructifications solitary at each serrature. Involucre forming a small pouch, after the capsules expand.

Found on *Prince of Wales' Island*, under the shade of trees, by Mr. W. Roxburgh.

6. *D. multiflora, R.* Icon. Roxb. 14, t. 98, (sub nomine Polypodii Davallioidis.) D. parallela, Wall. Cat. 63, No. 251, (quod nomen delendum.)

Fronds linear and linear-lanceolate, pinnate; leaflets alternate, crowded, sessile, linguiform, minute toward the top and base; margins crenulate; anterior angle of the truncated base enlarged. Fructifications in a single line of separate spots near the margin. Involucre reniform, separating outwards.

Nat. of the interior parts of *Bengal, Nepaul*, &c. The leaves are always erect, but when forced to rest on the ground, their tips take root and produce other plants.

Root fibrous, perennial.

Stem scaly, creeping under the surface of the earth.

Stipes short, channelled, covered with brown woolly scales.

Fronds linear, or linear-lanceolate, nearly a foot long. Fertile and barren nearly alike.

Pinnæ alternate, sessile, tongue-shaped, rather obtuse, serrulate, smooth on both sides, truncated at the base, and there the anterior angle is enlarged into an obtuse process; general length about an inch and a half, and less than half an inch broad towards the base, and apex; of the young greatly smaller.

Fructifications in numerous, (almost one for each serrature,) distinct spots, near the margin.

Involucre reniform, separating on the anterior and exterior edges.

Capsules very numerous, chesnut-coloured.

7. *D. pilosa. R.* Icon. Roxb. 14, 102, (sub nomine Polypodii ciliati.)

Fronds alternately bi-and-tripinnate, hairy; leaflets deeply crenate, or pinnatifid; ultimate segment thereof semicircular, somewhat crenulate, and generally three-flowered. Involucre ciliate and separating outwards.

Nat. of the eastern parts of the *Delta of the Ganges.* Thence introduced into the Botanic Garden, by Dr. Buchanan.

Root perennial, as thick as a rattan, hairy, creeping under the surface of the earth, from it descend many radical fibres.

Stipes suberect, of a pale green colour, and tender substance, hairy ; general length, frond included, from 2 to 3 feet.

Fronds alternately bipinnate, hairy.

Pinnæ 8-10 pair, alternate.

Pinnulæ alternate, numerous, smaller towards the apex, gashed, or pinnatifid, with the segments rounded and crenate.

Fructifications from 1 to 5 distinct spots, near the margin of each segments of the (fertile) pinnulæ.

Involucrum, a single, ciliate, reniform scale, separating outwards.

Capsules numerous, and in succession.

Note.—The habit of this Plant is very different from the firm, polished, compact texture of this genus, as mentioned by Dr. Smith.

8. *D. trapeziformis. R.*

Stipes smooth, nearly as long as the ovate-oblong, alternately bipinnate and tripinnatifid fronds (1-2 feet high ;) leaflets subtrapeziform, obtuse, and more or less divided into rounded segments. Fructifications in, generally, a single spot, near the bottom of the fissures of the ultimate segments. Involucre opening on the anterior margin, forming a pouch.

Nat. of the *Moluccas.* Is of a soft texture, tending to be villous.

9. *D. moluccana. R.* Wall. Cat. 66, No. 2219.

Stipes as long as the leaves, 4-sided, smooth. Fronds (1-2 feet high,) ovate, alternately bi-tripinnate; leaflets lanceolate, deeply gashed, smooth, and rather firm. Fructifications generally solitary, on the segments of the pinnules. Involucre a pouch.

Nat. of the *Moluccas.*

10. *D. chinensis. Smith.* Icon. Roxb. 14, t. 119. (unfinished pencilsketch.) D. tenuifolia. Sw. Wall. Cat. 63, No. 245.

Erect. Fronds lanceolate, alternately-tripinnate, polished; ultimate divisions decurrent, wedge-shaped; apices truncate and generally 2-flowered. Involucre dentate.

Trichomanes chinensis. Linn.

An elegant, erect, slender, polished species, from 1 to 2 feet high, and of a thin texture; a native of the eastern parts of *Bengal*, where it fructifies during the rains. The whole of the annulated capsulæ are inserted by means of very slender pedicels into the very bottom of the 2-valved pouch.

19. DICKSONIA.

Fructifications in roundish, marginal, distinct, prominent spots. *Involucre* double ; one (the inner,) from the (under) surface, separating outward ; the other from the margin of the frond turned in over the former, and separating inwards.

1. *D. moluccana. R.* Wall. Cat. 65, No. 2173.

Stipes, divisions a little hairy. Fronds (3-4 feet high,) alternately bipinnate ; leaflets ensiform, the fertile more deeply serrate, with the fructifications on the points of the serratures.

Nat. of the *Molucca Islands.*

20. CYATHEA.

Fructifications scattered, roundish, standing in an hemispherical calyx, which bursts at the top, without an operculum.

1. *C. pinnata. R.* C. Brunonis. Wall. Cat. 63, No. 179, (quod nomen delendum.)

Fronds (5-8 feet high,) smooth, alternately pinnate, leaflets linear, acute, and slightly waved ; above shining. Fructifications in numerous globose spots, near the nerve of the leaflets.

Nat. of *Prince of Wales' Island*, where Mr. W. Roxburgh found it under the shade of lofty trees.

2. *C. tripinnatifida. R.* C. excelsa. Sw. Wall. Cat 63, No. 181, (sub nomine C. bipinnatifidæ.) ?

Fronds many, (some 10 feet high,) alternately-tripinnatifid, smooth and firm ; leaflets broad-ensiform, toward the base deeply pinnatifid ; segments thereof falcate, entire, or serrulate, with a single row of 5-6 spherical spots of the fructifications on each side of their rib.

Nat. of the *Molucca* Islands.

These are the only two species of this very well-marked genus which I have yet met with in *India.* In both, the capsules while young, are enveloped in a thin, spherical, entire, membrane, affixed round their insertions on the frond, forming a resemblance to a pounce bag. When the capsules are advanced to maturity, they burst (generally) at the top.

21. TRICHOMANES.

Fructifications inserted into the margin of the leaf separate. *Involucre* urn-shaped, open-

ing outwards. *Columns* extending beyond the involucre, like styles.

1. *T. campanulatum R.* Hymenophyllum campanulatum. R. Wall. Cat. 66. No. 2199.

Creeping, villous; petioles erect, hairy, shorter than the 2-3-inches high, bipinnatifid leaves. Rachis winged. Fructifications at and near the apex of the fronds, campanulate.

Found by Dr. Buchanan at *Chittagong.*

2. *T. laciniatum. R.*

Fronds alternately pinnate, with the rachis fibrous; leaflets oblong, and cuneate-oblong, finely laciniate, firm and smooth, with a few long urn-shaped fructifications at their apices.

Nat. of the *Molucca Islands.*

3. *T. caruifolium. R.*

Stipes smooth, greatly longer than the tri-quadripinnatifid fronds, ultimate segments thereof sublinear and decurrent. Fructifications lateral, subpedicelled, with most long filiform columns.

Nat. of *Prince of Wales' Island,* where it grows in small tufts, about 4 or 6 inches high.

4. *T. lucidum. R.* Davallia elegans. Willd. Wall. Cat. 64. No. 253.

Scandent, stem scaly; stipes smooth, fronds polished and firm; subalternately quadripinnate; ultimate segments sub-lanceolate, serrate, gashed, or pinnatifid. Fructifications solitary, and sunk in the sinuses round the margins of the leaflets, compressed.

Nat. of *Prince of Wales' Island,* where it was found by W. Hunter, Esq.

I could discover no column in this plant; is it therefore to be referred to *Hymenophyllum ?*

The habit is rather firm and polished.

5. *T. malayanum. R.*

Stipes and rachis polished, fronds (4-5 feet high,) quadripinnate; ultimate divisions small and cuneate, with the flattened fructifications, (1 or 2,) in their truncated apices, and composed of two valves, without column.

Nat. of the *Malay Islands.*

22. MARATTIA.

Capsules oval, bursting longitudinally on their upper side; disclosing several cells in each division.

1. *M. pinnata. R.* Angiopteris crassipes. Wall. Cat. 63, No. 187.

Fronds (4-5 feet high,) smooth, generally oppositely pinnate, leaflets linear-lanceolate, entire, polished. Capsules numerous, crowded (cross-ways) into a broad, uninterrupted line, a little within the margin.

Nat. of the *Molucca Islands.*

T. Black & Co., 55, Bentinck Street.

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